



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

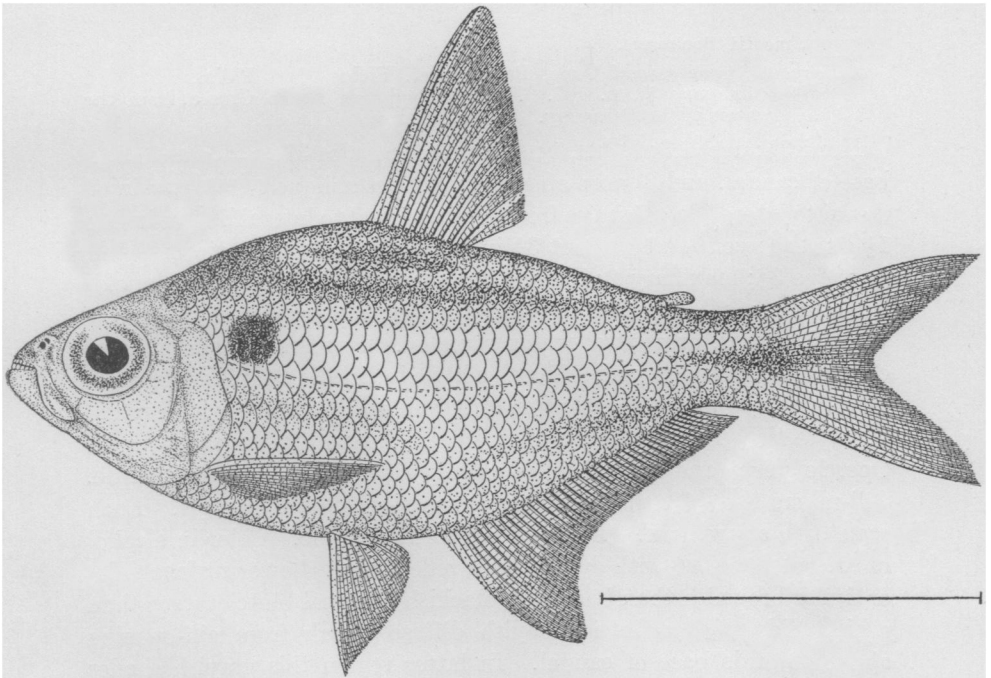
JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

FURTHER KNOWLEDGE OF SOME HETEROGNATHOUS FISHES. PART II.

BY HENRY W. FOWLER.

***Astyanax stilbe* (Cope). Fig. 34.**

Tetragonopterus stilbe Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 559. Type, No. 8,085, A. N. S. P. Para. De Schulte Buckow.—Cope, *l.c.*, p. 566 (evidently type).

Fig. 34.—*Astyanax stilbe* (Cope).

Width of head 2 in its length; interorbital space $2\frac{7}{8}$ in head measured from tip of upper jaw. Body compressed. Predorsal region with a median keel, and postdorsal region rounded. Preventral region rounded and postventral region trenchant. Caudal peduncle compressed. Head compressed. Snout moderately broad and surface convex. Rami of mandible not elevated inside mouth. Teeth in jaws mostly quindentate, 4 on each side in an outer series above, and

mandibulars large and powerful in front. A small basal maxillary tooth inside. Tongue flattened, rounded and a little free. Interorbital space convex. Gill-opening extending forward not quite opposite end of maxillary. Rakers 9 + 12?, lanceolate, and shorter than filaments which are $\frac{4}{5}$ of eye. Each scale with a few striæ. Tubes of lateral line simple. Vent close in front of anal. Color in alcohol pale brown, back a little darker than sides and lower surface with more or less silvery reflections. A silvered streak from humeral region, including rather vertical dusky-brown humeral blotch, to caudal, where it becomes dark brownish and continues out on median rays. Fins all dull or pale uniform brownish. Iris brassy-brown. Length $2\frac{1}{16}$ inches.

Astyanax moorii (Boulenger).

Tetragonopterus moorei Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 107. Near Chapada, in Matto Grosso, from the headwaters of the Paraguay. H. H. Smith.

Head $3\frac{3}{5}$; depth 3; D. III, 9; A. IV, 28, 1; scales 37 in lateral line to base of caudal, and 3 more on latter; 9 scales obliquely from origin of dorsal to lateral line; 7 scales from origin of anal to lateral line; pectoral $1\frac{1}{2}$ in head; ventral $1\frac{3}{4}$; snout $3\frac{3}{4}$ in head measured from tip of upper jaw; eye $3\frac{1}{2}$; maxillary 2; interorbital space 3. Body elongate ovoid. An obtuse median predorsal keel, also one on postdorsal and post-ventral regions, pre-ventral region rounded. Head rather short, deep, compressed, muzzle blunt. Mouth a little inclined. Maxillary reaches middle of eye and its expansion $\frac{2}{3}$ of same. Maxillary with several basal teeth. Tongue fleshy, little free. Interorbital space convex. Opercle deep, and second infraorbital with rather indistinct striæ. Gill-rakers 10 + 12, shorter than filaments, which are $\frac{4}{5}$ of eye. Each scale with a few striæ. Tubes of lateral line simple. Color in alcohol brown, more or less with dull silvered reflections. Lower surface paler or duller brownish than back. A blackish humeral blotch larger than orbit. Side with a broad grayish diffuse streak from gill-opening above towards base of caudal. In latter region this grayish shades into dusky or blackish and extends out on median caudal rays. Fins otherwise all pale brownish, dorsal and caudal a little darker. Jaws a little brownish in front. Iris light brown with a dark brown ring. Length $4\frac{1}{4}$ inches.

Astyanax bimaculatus (Linnaeus).

Tetragonopterus caudimaculatus Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 107. Headwaters of the Tocantius. H. H. Smith.

Head $3\frac{1}{2}$; depth $2\frac{2}{3}$; D. III, 9; A. IV, 31, 1; scales 40 in lateral line to

base of caudal, and 3 more on latter; 9 scales in an oblique series back from origin of dorsal to lateral line; 7 scales from base of ventral to lateral line; 16 scales before dorsal; pectoral $1\frac{1}{2}$ in head; ventral $1\frac{3}{4}$; least depth of caudal peduncle $2\frac{1}{5}$; snout $3\frac{3}{8}$ in head, measured from tip of upper jaw; eye $3\frac{1}{3}$; interorbital space $2\frac{1}{5}$. No maxillary teeth. Gill-rakers 10 + 14 on first arch, slender, pointed and much shorter than filaments. Origin of dorsal nearer tip of upper jaw than base of caudal. Color in alcohol brownish, back darker than side and lower surface. Black humeral blotch conspicuous. Blackish dash at base of caudal and on side of caudal peduncle also pronounced. Each scale on side with a few brownish points or dots so that indistinct longitudinal series are formed. Iris brownish with a darker ring. Length $4\frac{1}{2}$ inches. Headwaters of the Tocantius. H. H. Smith. Also 3 other examples with same data showing: Head $3\frac{2}{5}$ to $3\frac{3}{4}$; depth $2\frac{1}{2}$ to $2\frac{4}{5}$; D. III, 9; A. IV, 28, 1 to IV, 29, 1, usually latter; scales 38 to 42 in lateral line to base of caudal, and 3 more on latter; 9 scales in an oblique series from origin of dorsal back to lateral line; 7 or 8 scales from base of ventral to lateral line; 9 scales from origin of anal to lateral line; 15 or 16 scales before dorsal; total length of specimens 3 to $4\frac{3}{16}$ inches.

Cope was evidently wrong in identifying this near *Tetragonopterus caudomaculatus* Günther which has only 26 anal radii.

Also two in bad condition from the Peruvian Amazon. Prof. J. Orton. One of these has the humeral blotch large and pronounced.

***Astyanax laeustris* (Lütken).**

Head $3\frac{2}{7}$; depth $2\frac{1}{4}$; D. III, 9; A. IV, 27, 1; scales 35 in lateral line to base of caudal, and 2 more on latter; 8 scales obliquely back from origin of dorsal to lateral line, and 5 scales in same way from origin of adipose dorsal; 6 scales in a vertical series between base of ventral and lateral line; 7 scales between origin of anal and lateral line; 14 scales before dorsal; snout 4 in head, measured from tip of upper jaw; eye $2\frac{2}{5}$; maxillary $2\frac{2}{5}$; interorbital space $2\frac{2}{5}$; least depth of caudal peduncle $2\frac{1}{3}$; pectoral $1\frac{1}{5}$; ventral $1\frac{3}{5}$. Maxillary toothless, and reaching front margin of pupil. Rakers about 10 + 15, slender, and a little shorter than filaments. In alcohol brownish, lower surface and sides paler or whitish and everywhere more or less washed with silvery. An ellipsoid blotch of blackish, in length about equal to orbit, on shoulder. Base of caudal pale brownish and median caudal rays brownish. A silvery streak from shoulder to caudal. Iris silvery-brassy. Length $2\frac{5}{16}$ inches. Para, Brazil. De Schulte Buckow. Coll. J. C. Brevoort.

This example agrees largely with Lütken's excellent figure.

Astyanax orientalis (Cope). Fig. 35.

Head $3\frac{1}{4}$ to $3\frac{3}{7}$; depth $2\frac{1}{5}$ to $2\frac{3}{7}$; D. III, 9; A. IV, 27 to 29; eye $2\frac{3}{4}$ to $2\frac{4}{5}$ in head measured from tip of upper jaw; interorbital space $2\frac{3}{8}$. Body well compressed. Snout broad, with convex surface. Teeth as usual in the genus. Maxillary toothless. Tongue thick, fleshy and little free. Interorbital space broad and convex. Gill-opening extends nearly opposite front margin of orbit. Rakers 9 + 14, lanceo-

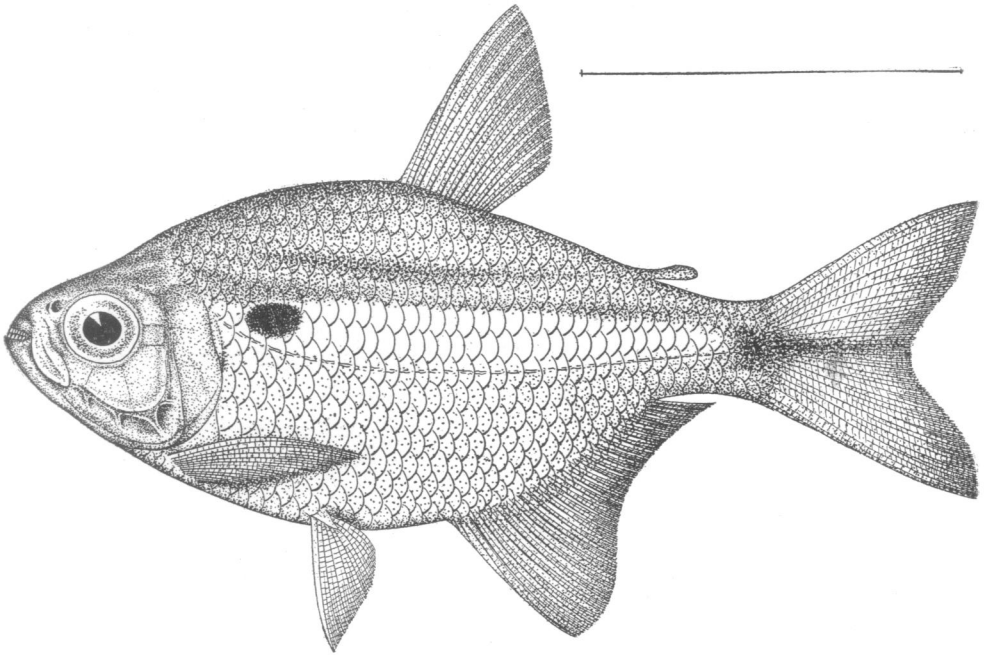


Fig. 35.—*Astyanax orientalis* (Cope).

late, and much shorter than filaments, which are $\frac{5}{7}$ of orbit. A few striæ on each scale. Tubes in lateral line simple. Vent close in front of anal. Color in alcohol brownish, peritoneum showing through paler. Fins all pale brownish. Lower side of head silvery. An elongate blackish-brown humeral blotch and a similar shade at base of caudal continued out on median rays. A rather indistinct silvery band from shoulder to base of caudal. Length of largest, with damaged caudal, $2\frac{1}{2}$ inches. Paramaribo, Dutch Guiana. Dr. Charles Hering.

These examples seem to agree best with *Tetragonopterus orientalis* Cope. The discrepancies in the depth of the body may be accounted for by age, as the younger ones are more elongate. The anterior anal rays are however much longer than the others. The eye was evidently found to be 3 in the head, which also may possibly be attributed to age, though my examples show it but a little less than interorbital space.

Tetragonopterus viejita Valenciennes may be closely related or identical, as it agrees in some respects, though it is impossible to consider it on account of the imperfect diagnosis.

***Astyanax rutilus* (Jenyns).**

Tetragonopterus rutilus Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 87. Brazilian province of Rio Grande do Sul. H. H. Smith.

Head $3\frac{2}{3}$ to $4\frac{1}{3}$; depth $2\frac{2}{3}$ to $2\frac{3}{4}$; D. III, 9, rarely III, 10; A. IV, 25, 1 to IV, 28, 1, usually 25 or 26 developed rays, rarely 27 or 28; scales 35 to 40 in lateral line to base of caudal, usually 37 or 38, and 3 more on latter; 7 scales in an oblique series back from origin of dorsal to lateral line, rarely 8; 5 or 6 scales, usually latter, from base of ventral to lateral line; usually 6 scales from origin of anal, not counting those on base of fin, to lateral line; 15 or 16 scales before dorsal; length of 12 specimens ranging from 2 to 6 inches.

I differ with Cope concerning the statement that this species resembles *Astyanax jequitinhonæ* (Steindachner). Most of my specimens agree quite well with the latter's figure of *A. rutilus*.

***Astyanax jacuhiensis* (Cope).**

Tetragonopterus jacuhiensis Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 88, Pl. 6, fig. 6. Cotypes, 21,606 to 21,611; 21,683 to 21,703; 21,912 (type) to 21,916, A. N. S. P. The Jacuhy (Brazilian province of Rio Grande do Sul). H. H. Smith.

Head $3\frac{2}{3}$; depth $2\frac{1}{10}$; D. III, 9; A. IV, 28, 1; scales 35 in lateral line to base of caudal, and 2 more on latter; 6 scales obliquely back from origin of dorsal to lateral line; 8 scales in a vertical series between origin of anal in lateral line; pectoral $1\frac{1}{3}$ in head; ventral $1\frac{2}{3}$; snout $3\frac{2}{3}$ in head measured from tip of upper jaw; eye $3\frac{1}{5}$; maxillary $2\frac{2}{3}$; interorbital space $2\frac{2}{3}$. Body compressed. Predorsal and postventral regions with low median keel, postdorsal rounded and preventral with a low keel on each side. Lips rather fleshy. Teeth as usual. Tongue small, rounded, and little free in front. No maxillary teeth. Interorbital space convex and rather broad. Gill-opening forward to anterior nostril. Rakers 9 + 12?, longest $\frac{2}{3}$ of filaments, which are $\frac{2}{3}$ of orbit. Scales striate. Tubes in lateral line simple. Color in

alcohol dull brownish, back darker than lower surface and everywhere more or less sheened with dull silvery. A dusky blotch at base of caudal and another rounded one on humeral region. Former extends midway on side of caudal peduncle, and medianly out on caudal. Humeral spot in a pale area bordered posteriorly with dusky. Also a dusky streak sloping down from humeral spot towards pectoral. On scales just behind gill-opening above base of pectoral a dusky shade. Fins all pale brownish. Iris brownish with a chestnut ring. Length, caudal damaged, $4\frac{3}{4}$ inches. Type.

The other cotypes show: Head $3\frac{1}{8}$ to $3\frac{1}{5}$; depth 2 to $2\frac{3}{4}$; D. III, 8 rarely, usually, III, 9, and occasionally III, 10; A. IV, 21, I to IV, 27, I, usually 25, I, or 26, I; scales 31 to 34 in lateral line to base of caudal, and mostly 2 or 3 more on latter; 6 to 8 scales obliquely back from origin of dorsal to lateral line, usually 7; 5 to 7 scales obliquely or vertically between origin of ventral and lateral line, usually 6, less frequently 7, and rarely 5; 12 to 16 scales before dorsal, mostly 14, sometimes 13, less frequently 15 and rarely 12 or 16; pectoral $1\frac{1}{2}$ to $1\frac{1}{3}$ in head; ventral $1\frac{1}{4}$ to $1\frac{3}{4}$; total length of specimens $1\frac{1}{8}$ to $4\frac{1}{2}$ inches. Cope's figure fails to indicate the anterior anal rays as a little longer than the others. The young appear more evenly ellipsoid than the adults.

Astyanax atahualpianus sp. nov. Fig. 36.

Tetragonopterus agassizii Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Near Pebas. Prof. J. Orton.

Head $3\frac{2}{5}$; depth $2\frac{3}{4}$; D. III, 9; A. III, 21; P. I, 11; V. I, 7; scales (squamation damaged) about 24? in lateral line to base of caudal, and 2 or 3 more evidently on latter; about 6? scales obliquely back from origin of dorsal to lateral line; about 4? scales vertically from origin of anal to lateral line; width of head about $2\frac{1}{2}$ in its length; depth of head, over middle of orbit, $1\frac{1}{2}$; mandible $2\frac{1}{4}$; least depth of caudal peduncle $2\frac{2}{5}$; snout $3\frac{2}{5}$ in head, measured from tip of upper jaw; eye $2\frac{2}{5}$; maxillary 2; interorbital space $2\frac{1}{4}$.

Body elongate, rather ellipsoid, well compressed, upper profile perhaps a little more convex, and greatest depth apparently at origin of dorsal. Caudal peduncle compressed, and its least depth about equal to length.

Head moderately short, deep, compressed, muzzle blunt and heavy, and upper profile nearly straight from snout to occiput. Snout short, rather narrow, and surface convex. Eye circular, a little anterior and superior. Mouth large and a little inclined. Maxillary long, oblique, its greatest width a trifle more than half of pupil, and its posterior

extremity reaching beyond front margin of orbit, but not till opposite front margin of pupil. Mandible strong, protruding beyond tip of upper jaw, and rami not elevated inside of mouth. Lips rather thin. Teeth in jaws mostly quidentate, 4 on each side, in an outer series above, and those forming mandibular series large and powerful. Maxillary with 2 basal denticles. Tongue apparently flattened, a little elongate and hardly free. Nostrils, as usual, in front of eye above. Interorbital space moderate, and convex. Opercle deep, and upper posterior edge emarginate. Greatest width of infraorbital rim greater than greatest exposed breadth of opercle.

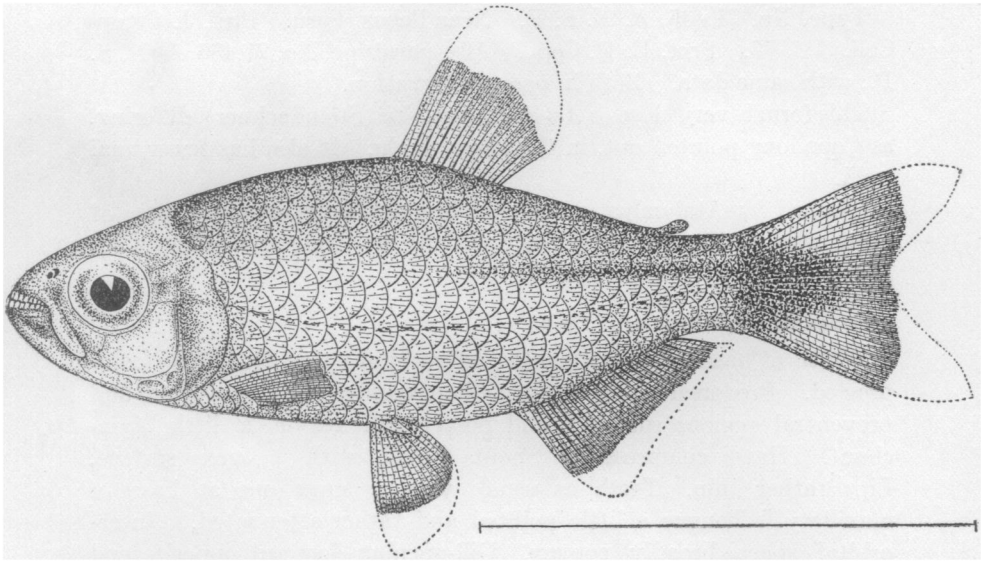


Fig. 36.—*Astyanax atahualpianus* Fowler.

Gill-opening extending forward about opposite posterior extremity of maxillary. Rakers about $8 + 11?$, lanceolate, and shorter than filaments which are about $\frac{4}{5}$ of orbit. Isthmus narrowly triangular.

Scales mostly fallen, cycloid, each with several striæ, thin, large, not narrowly imbricated, and apparently disposed in longitudinal series parallel with lateral line. Base of anal apparently with a low sheath of small scales. Base of caudal also covered with small scales. Lateral line apparently as usual or a little decurved, then sloping up to base of caudal, though a little low at first along side of caudal peduncle. Tubes simple.

Origin of dorsal much nearer base of caudal than tip of mandible

and anterior rays apparently well elevated. Anal inserted just behind base of last dorsal ray, also nearer base of caudal than origin of pectoral, and anterior rays apparently elongated. Caudal forked, lobes apparently pointed. Pectoral small, evidently not attaining ventral(?). Ventral inserted a little before origin of dorsal or nearly midway between origin of pectoral and that of anal, and perhaps reaching(?) latter.

Color in alcohol brownish, back darker, and side evidently silvered. Fins brownish, except base of caudal which is largely blackish. No trace of humeral blotch. Iris brownish.

Length $1\frac{1}{8}$ inches (caudal damaged).

Type, No. 21,435, A. N. S. P. Near Pebas, Peru. Prof. J. Orton. Coll. of 1877. Prof. E. D. Cope. Also paratype, No. 21,436, A. N. S. P., with same data. Both in poor preservation.

This form is very close to *Astyanax agassizii* (Steindachner), differing, as Cope long pointed out, in the longer body. It also has fewer anal radii.

(Named for Atahualpa, among the last of the unfortunate Incas of Peru, who was strangled by the Spaniards at Cajamarca, August 29, 1533.)

***Astyanax oligolepis* (Günther). Fig. 37.**

Width of head $1\frac{3}{4}$ in its length; interorbital space $2\frac{1}{4}$. Body compressed. Predorsal region with a median rounded ridge, postdorsal and preventral regions rounded, and postventral region a little trenchant. Head compressed. Snout broad with convex surface. Lips rather thin. Teeth as usual, with a small one at base of maxillary. Tongue a little pointed and rather attenuated. Interorbital space broadly convex. Gill-opening forward opposite end of maxillary. Rakers 9 + 11, about $\frac{3}{4}$ length of filaments which are $\frac{2}{3}$ of eye. Scales with several radiating striæ. Tubes in lateral line simple. Color in alcohol brownish, evidently discolored greenish. About 8 or 9 longitudinal dark streaks, each one following in courses of scales at their junctions above and below. Fins more or less plain brownish, and dorsal and caudal perhaps a little darker. Iris dull orange-brown. Length $3\frac{7}{8}$ inches. Peruvian Amazon. Prof. J. Orton Coll. Also 2 other examples.

The above account agrees largely with Dr. Günther's, though the eye is larger and the maxillary extends to the front margin of the eye in his examples. In mine there are indistinct traces of both caudal and humeral spots which I suspect have more or less faded.

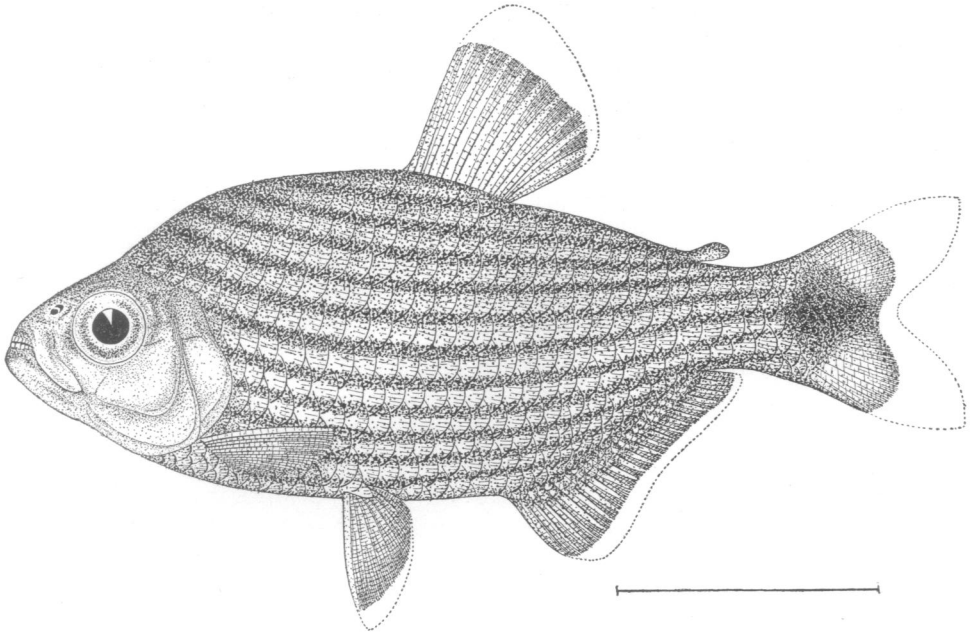


Fig. 37.—*Astyanax oligolepis* (Günther).

***Astyanax abramis* (Jenyns).**

Tetragonopterus sp. indet. Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Peruvian Amazon. Prof. J. Orton.

Head 3 to $3\frac{2}{3}$; depth $2\frac{2}{5}$ to 3; D. III, 9; A. IV, 24? (usually more) to 30; scales about 44 to 48 (according to pockets) in lateral line to base of caudal and usually 3 more on latter; 19 to 21 scales before dorsal, the usual number 19 or 20; 10 to 12 scales in an oblique series back from origin of dorsal to lateral line; about 7? to 9 scales in a vertical series from origin of anal to lateral line; eye $2\frac{3}{4}$ to $3\frac{1}{3}$ in head, measured from tip of upper jaw; length of specimens (caudals damaged) $2\frac{3}{4}$ to $3\frac{1}{3}$ inches. A tooth at base of maxillary. Coll. of 1873. A series of 25 poorly preserved examples.

The larger examples are deeper and have the anal beginning a little before bases of last dorsal rays. Pectoral reaching a little beyond origin of ventral, and latter reaches that of anal. Caudal and humeral blotches evident in alcohol. Pectoral and ventral blackish, and anal also finely specked with dusky.

Although certain minor discrepancies may be noted between Jenyns' figure and these examples I believe they are identical. Jenyns

fails to indicate either the humeral or the caudal blotch which are here very distinct.

Dr. Eigenmann has recently recorded under the name *Pæcilurichthys abramis* some specimens from Paraguay which apparently are the present species.

***Tetragonopterus chalceus* Agassiz.**

Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 260. Ambyiacu River, Ecuador. John Hauxwell.—Cope, *l.c.*, p. 291. Between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale River. Robert Perkins.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Marañon. Prof. J. Orton.

Tetragonopterus ortonii Cope, *l.c.* XI, 1869-70 (August 16, 1870), p. 566. Pebas, Peru. John Hauxwell.

Head 3 to $3\frac{3}{8}$; depth $1\frac{1}{2}$ to 2; D. III, 9; A. IV, 30, 1 to IV, 36, 1, usually 33 developed rays, frequently 34, and other numbers rare or exceptional; 29 to 31 scales in lateral line to base of caudal, usually 30, and 3 more on latter; 8 scales in an oblique series back from origin of dorsal to lateral line; 5 scales from root of ventral to lateral line; 6 scales from origin of anal, not counting any on fin, to lateral line; length of 13 examples from $2\frac{1}{8}$ to $4\frac{7}{8}$ inches. Hauxwell, Perkins and Orton.

The example recorded from Pebas, eastern Peru, by Cope as *T. ortonii* is identical. It shows: Head $2\frac{7}{8}$; depth about $1\frac{9}{16}$; D. III, 9; A. IV, 33?; scales (squamation damaged) about 28? in lateral line to base of caudal; snout about 4 in head, measured from tip of upper jaw; eye $2\frac{1}{4}$; interorbital space 3. A dusky blotch at base of caudal. Length (caudal damaged) $2\frac{1}{16}$ inches. John Hauxwell.

Tetragonopterus ortonii Gill is possibly this species, though I have not examined the type.

***Tetragonopterus ovalis* (Günther). Fig. 38.**

Tetragonopterus chalceus Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 691. Marañon. Prof. J. Orton.

Interorbital space $2\frac{1}{2}$ in head. Body compressed. Predorsal region with a median keel, postdorsal region rounded, preventral region a little broad and flattened with a lateral keel on each side, and postventral region trenchant. Snout broad and convex. Several small teeth at base of maxillary inside. Some teeth in inner series of upper jaw with more than 5 cusps. Tongue fleshy, thick and little free. Interorbital space broad and convex. Gill-opening forward opposite anterior margin of orbit. Rakers 9 + 11, lanceolate, half of filaments, which are $\frac{4}{5}$ of eye. Each scale with several radiating striæ. Tubes in lateral line simple. Vent shortly before anal. Color in alcohol with scales faded brassy-brown, back darker, also top of head. Side of head burnished silvery. Fins pale brownish.

Where scales fell from trunk a broad silvery band exposed, extending from eye to middle of base of caudal. Humeral and caudal spots if present in life now faded entirely. Iris reddish-brown. Length $2\frac{3}{4}$ inches. Coll. of 1877.

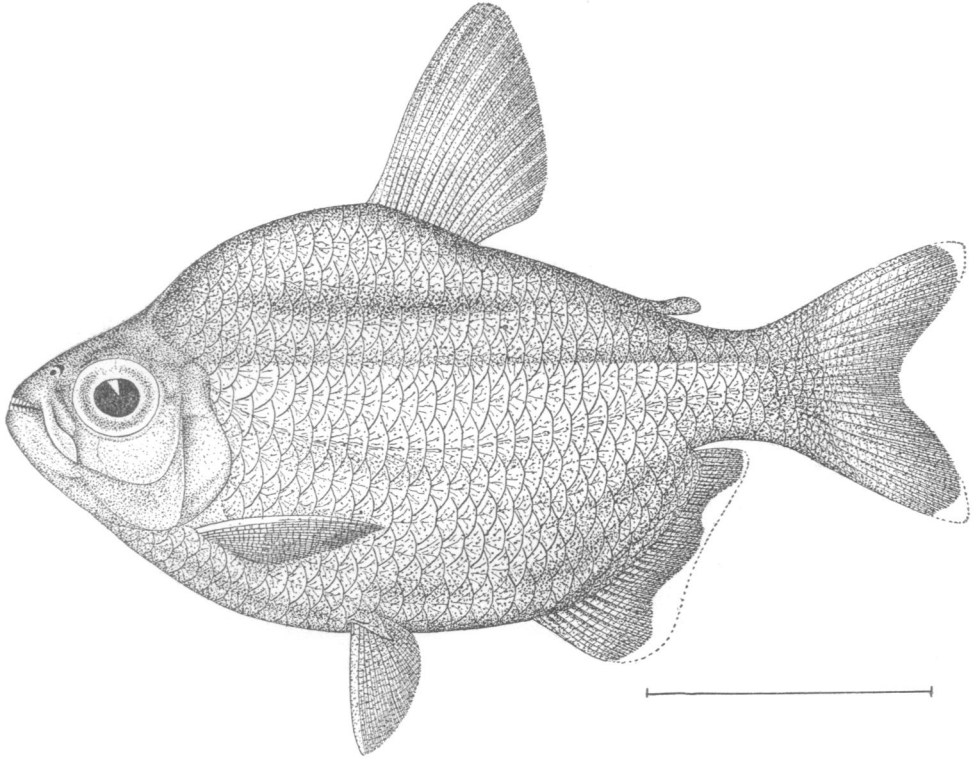


Fig. 38.—*Tetragonopterus ovalis* (Günther).

Plethodectes erythrurus Cope.

Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 563, figs. 6 and 6a. Type, No. 8,032, A. N. S. P. Pebas, Equador. John Hauxwell.

Chalceus erythrurus Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 262 (type).

Width of head $2\frac{1}{4}$ in its length; interorbital space $2\frac{7}{8}$ in head measured from tip of upper jaw. Body compressed, and dorsal edge apparently rounded. Head compressed. Snout about as broad as long, and rounded when viewed from above. Gill-opening reaching tip of maxillary. Rakers 7 + 9?, little shorter than filaments, which equal pupil. Each scale with about 5 striæ. Tubes in lateral line

simple. Color in alcohol brown, abdomen and lower surface of head paler, especially that of muzzle. Upper surface of head brown. Dorsal, anal and ventral dusky-brown, latter deepest. Caudal, except dusky-brown median rays, pale brownish. Pectoral pale brownish. Lips brownish. Iris silvered brown. Length $2\frac{9}{16}$ inches (caudal damaged). Type.

Cope states concerning the scales "transverse (above l. line) 16," which is surely wrong as he already had stated "scales large, l. series 6 at ventrals."

PELLEGRININA gen. nov.

Type *Pellegrinina heterolepis* sp. nov.

This genus differs from *Alestes*, *Brachyalestes* and *Brycinus* in the short anal basis and large dorsal scales.

(Named for Dr. J. Pellegrin, of the Museum of Natural History, Paris, author of many important contributions to Ichthyology.)

Pellegrinina heterolepis sp. nov. Fig. 39.

Head 3; depth $3\frac{1}{2}$; D. III, 10; A. III, 9, 1; P. II, 15; V. II, 8; scales about 29? (squamation damaged) in lateral line to base of caudal, and several more on latter; 4 scales between origin of dorsal and lateral line; 3 scales between origin of adipose fin and lateral line; 2 scales between base of ventral and lateral line; 2 scales between origin of anal and lateral line; 9 scales before dorsal; width of head 2 in its length; depth of head over posterior margin of orbit $1\frac{3}{4}$; snout $3\frac{1}{4}$; eye $3\frac{2}{5}$; maxillary 3; mandible $2\frac{3}{4}$; interorbital space $2\frac{2}{5}$; third dorsal ray $1\frac{1}{2}$; third anal ray $1\frac{3}{4}$; least depth of caudal peduncle 3; pectoral $1\frac{2}{5}$; ventral $1\frac{1}{2}$.

Body elongate, rather slender, well compressed, profiles similarly and slightly convex with greatest depth about middle of depressed pectoral. Predorsal region with a very obsolete median keel. Breast flattened, and preventral region otherwise similar to predorsal. Postventral region with a median obsolete keel, also postanal. Postdorsal region rounded, keel not evident. Caudal peduncle small, well compressed, and its length a little less than least depth.

Head elongate, broad above, sides flattened and becoming somewhat constricted below, profiles similar. Snout broad, rounded when viewed from above. Eye large, circular, anterior and high. Jaws large, about even. Maxillary rather small, narrow, reaching a little past front of orbit though not to front rim of pupil. Teeth in upper jaw triserial, outer series 17, slender and tridentate, and second series

of 4 anteriorly resembling inner series except smaller. Inner series of upper teeth 11, broad, compressed, quindentate and surface crenulate. Mandible with about 11 robust quindentate teeth in an outer series, and a recurved canine forming an inner series, one on each side of symphysis. Outer series of mandibular teeth continued along each ramus of mandible posteriorly, where it is also not elevated inside mouth, as very weak denticles. Along edge of maxillary some weak denticles, most developed and crowded towards its base. Buccal membranes in mouth rather broad. Tongue small, little free. Nostrils together, close in front and falling nearly opposite middle in depth

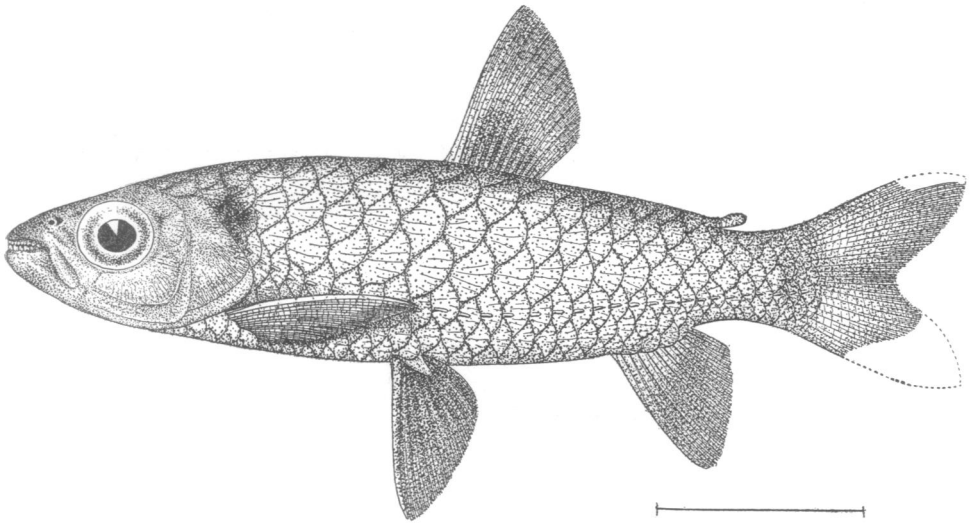


Fig. 39.—*Pellegrinina heterolepis* Fowler.

of eye. Interorbital space broad and but slightly convex, not elevated. Infraorbital broadest in chain, and its greatest exposed width not quite equal to that of opercle. Bones in orbital chain, and opercle, with slight striæ marginally.

Gill-opening extending forward about opposite front rim of pupil. Gill-rakers about 7 + 9 weak points less than half of pupil in length. Filaments about equal to pupil. Isthmus narrow, with a convex surface.

Scales cycloid of various size, those on upper half large, and lower reduced and of crowded appearance. Each scale with radiating striæ. Scales along base of anal and caudal small. Lateral line of simple tubes, decurved and extending rather low till on base of caudal.

Origin of dorsal falling nearly midway between front margin of eye and base of caudal, and third ray apparently longest, others graduated down. Adipose dorsal inserted near last fourth in space between origin of dorsal and base of caudal, and its length about $\frac{3}{4}$ of orbit. Anal inserted well behind base of dorsal or nearly midway between origin of dorsal and base of caudal, and graduated from about fourth ray, which is apparently longest. Caudal emarginate and lobes apparently pointed. Pectoral long, reaching a little beyond ventral. Ventral inserted a little in front of dorsal, and reaching nearly $\frac{3}{4}$ of space to anal.

Color in alcohol pale brownish, upper surface apparently scarcely darker. Fins plain pale brownish, dorsal with a brownish blotch basally, made up of specks, also one on anal, and ventrals dotted brownish. A large dusky humeral blotch. Iris brassy.

Length $4\frac{3}{4}$ inches (caudal damaged).

Type, No. 8,150, A. N. S. P. Probably some part of West Africa. A single example.

(*Ετερος*, various; *λεπίς*, scale.)

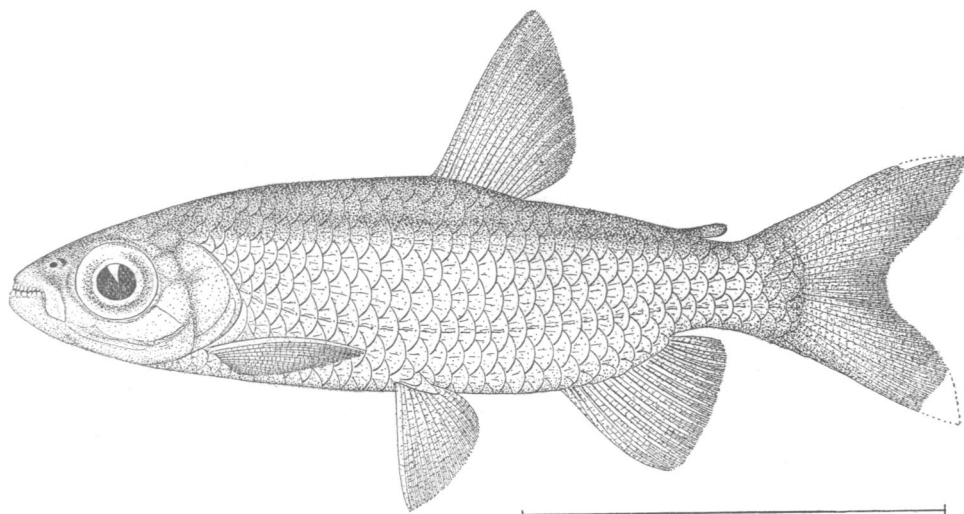


Fig. 40.—*Brachyalestes nurse rüppellii* (Günther).

***Brachyalestes nurse rüppellii* (Günther). Fig. 40.**

Alestes rüppellii Günther, Proc. Zool. Soc. London, 1896 (February 4), p. 223. Lake Rudolf. Dr. A. D. Smith.

Width of head $2\frac{1}{2}$ in its length; interorbital space $3\frac{1}{2}$ in head measured from tip of upper jaw. Body well compressed and edges apparently

all rounded. Head compressed. Snout short, a little broader than long, and edge strongly convex as viewed from above. Mouth broad. No maxillary teeth. Tongue small and hardly free. Interorbital space a little convex. Gill-opening reaches front margin of pupil. Rakers $12 + 17?$, slender, about $\frac{2}{3}$ of orbit and shorter than filaments. Each scale with 1 or more inconspicuous radiating striæ. Tubes in lateral line simple. Color in alcohol more or less silvery, and back and upper surface of head brown with pale purple reflections. Jaws pale brownish, also fins, dorsal and caudal hardly darker. Iris brassy. Length $2\frac{1}{4}$ inches.

Brachyalestes affinis (Günther). Fig. 41.

Alestes affinis (Günther), Proc. Zool. Soc. London, 1896 (February 4), p. 223. Shebeli River, Africa. Dr. A. D. Smith.

Width of head $1\frac{1}{2}$ in its length; interorbital space $2\frac{1}{2}$ in head measured from tip of upper jaw. Body well compressed, and edges apparently all rounded. Head robust. Snout convex on surface, and obtuse when viewed above. Mouth broad. No maxillary teeth.

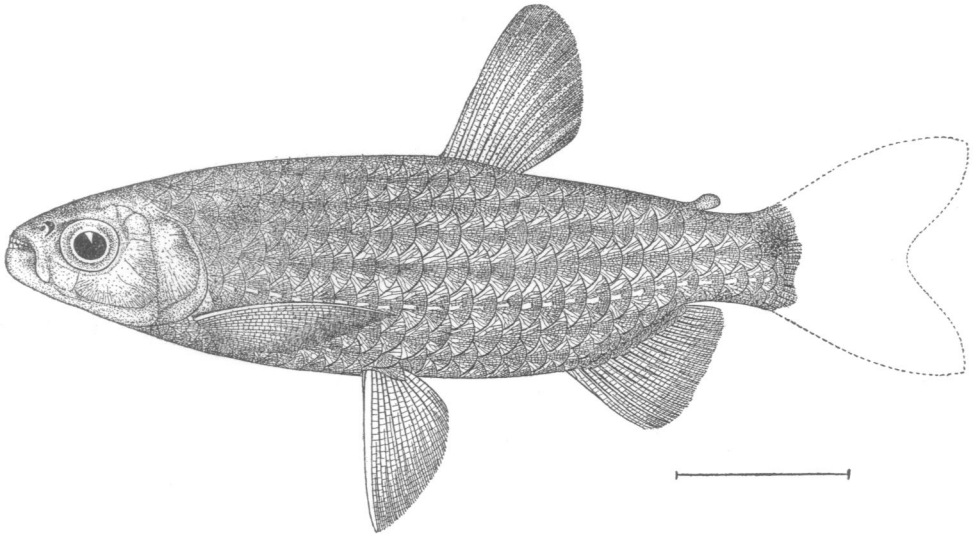


Fig. 41.—*Brachyalestes affinis* (Günther).

Tongue small and not free. Interorbital space broad and evenly convex. Gill-opening reaching front rim of pupil. Rakers $12 + 15$, slender, and longest $\frac{3}{4}$ of pupil. Each scale with many reticulating striæ. Color in alcohol faded plain pale brownish, and back and upper

surface but a shade darker. Traces of a broad silvery lateral band, about equal to orbit in width, extends to caudal. Traces of a brownish blotch at shoulder and of another at base of upper caudal lobe. Fins pale brownish, dorsal and caudal hardly darker. Iris brassy-brown. Length (caudal damaged) $4\frac{3}{4}$ inches.

Brycon capito Cope. Fig. 42.

Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 261. Type, No. 8,058, A. N. S. P. Ambyiacu River John Hauxwell.

Width of head $2\frac{1}{5}$ in its length; interorbital space 3 in head measured from tip of upper jaw. Body well compressed. Head compressed. Snout broader than long, depressed above. Teeth in mandible largest, especially 6 anterior ones which are quindentate. Rami not elevated, with small simple conic teeth like those in front of upper jaw and becoming graduated posteriorly. Outer series of teeth in upper jaw like those on side of lower. Smaller ones continued out on edges of maxillaries in a single series its entire length, though more properly a

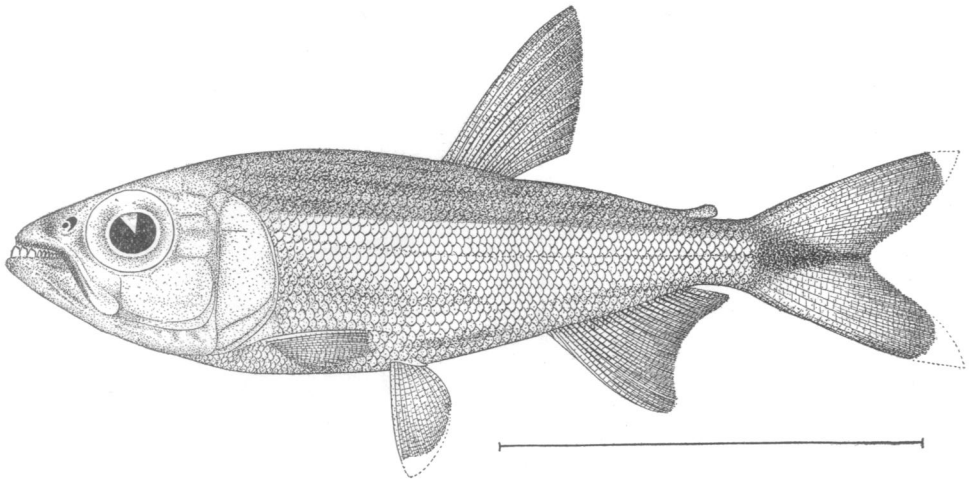


Fig. 42.—*Brycon capito* Cope.

continuation of inner series in upper jaw. In front of upper jaw teeth somewhat triserial with innermost quindentate and enlarged. An inner series formed of 2 conic teeth at symphysis. Tongue narrow anteriorly, little free. Interorbital space broad and flat. Gill-opening to first $\frac{2}{3}$ of eye. Rakers 9 + 15, slender, and shorter than longest filaments, which are $\frac{2}{3}$ of eye. Vent close in front of anal. Color in alcohol brownish-gray, becoming leaden on sides and whitish below. Fins pale brownish, and middle rays of caudal darker brown than rest of fin. Side of head silvery. Iris brassy-brown. Length $2\frac{1}{4}$ inches.

Brycon melanopterum (Cope).

Megalobrycon melanopterum Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 262, Pl. 13, fig. 1. Cotypes, Nos. 8,035 (type) and 8,036, A. N. S. P. Ambyiacu River. John Hauxwell.

Width of head 2 in its length; interorbital space $2\frac{3}{8}$. Body compressed, and edges apparently all rounded. Head becoming more or less constricted below. Snout broad, rounded when viewed above. Mouth broad. Outer enlarged mandibular teeth 8, quindentate, and lateral series becoming smaller posteriorly. An inner lateral series of mandibular teeth, small, and at symphysis a small conic tooth inside. Maxillary toothed, its entire edge in a single series. Teeth in upper jaw triserial anteriorly, laterally biserial, and each of inner series at least tridentate, those in third anterior series enlarged and quindentate. Tongue thick, fleshy and little free. Interorbital space broadly convex. Gill-opening to about first $\frac{1}{4}$ of eye. Rakers about $8 + 13$, lanceolate, and longest $\frac{4}{7}$ of longest filaments, which are $\frac{4}{7}$ of eye. Scales strongly striate and finely ciliate. Color in alcohol pale brownish, back and upper surface of head a little deeper colored. Fins pale brownish, and dorsal, caudal and anal tinted a little brownish. Along middle of upper caudal lobe longitudinally a dusky-brown blotch, deepest at base of lobe. This margined below diffusely with grayish-white. Along base of anal a brownish shade. Iris brassy-brown. Length $6\frac{3}{4}$ inches (caudal damaged). Type.

Also 4 examples from the Peruvian Amazon from Prof. James Orton Coll.

Though I allow the above specimens of this species as distinct from *Megalobrycon cephalus* Günther, it is possible that they may be found identical. Cope pointed out that *M. melanopterum* differs in the outer series of teeth in the upper jaw being more than double the size of those on the maxillary, as stated for *M. cephalus* by Dr. Günther. The apparently uniform coloration is a feature of striking difference, and as Dr. Günther's examples were 13 inches long, may be one of age. *Brycon falcatus* Müller and Troschel, from Guiana, is also related.

Chalcinus albus (Cope).

Triportheus albus Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 264, Pl. 14, fig. 3. Type, No. 21,234, A. N. S. P. Ambyiacu River. John Hauxwell.

Width of head $2\frac{1}{2}$ in its length; interorbital space 3 in head measured from tip of upper jaw. Body strongly compressed and preventral region trenchant. Snout with convex surface, and rounded when viewed from above. Teeth in upper jaw mostly biserial, or only irregularly triserial, quindentate, and median inner series expanded

and enlarged. Mandibular teeth uniserial, except 2 simple conic ones in front at symphysis forming an inner series. On each ramus of mandible 4 anterior enlarged and distinctly quidentate teeth. At base of maxillary 2 small denticles. Tongue rather narrow, a little fleshy, rounded and hardly free in front. Interorbital space rather broad and convex. Gill-opening reaching opposite anterior margin of pupil. Rakers 13 + 22, slender, fine, shorter than filaments, which are $\frac{4}{5}$ of orbit. Color in alcohol faded brownish, more or less leaden on sides, and side of head and abdomen silvered. Fins pale brownish, middle of caudal dusky. Lips brownish. Iris brownish. Length $2\frac{1}{2}$ inches (caudal damaged).

Chalcinus angulatus (Agassiz).

Chalcinus brachypomus Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Pebas, Eastern Peru. John Hauxwell.—Cope, *l.c.* Para. De Schulte Buckow.

Triportheus flavus Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 264, Pl. 14, fig. 1. Cotypes, Nos. 8,077 (type) to 8,080, A. N. S. P. Ambyiacu River. John Hauxwell.

Triportheus nematurus Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 692. Peruvian Amazon. Prof. J. Orton.

Head $3\frac{1}{2}$; depth $2\frac{4}{5}$; D. II, 9; A. IV, 27, 1; scales 34 in lateral line to base of caudal, and apparently 4 more on latter; 6 scales obliquely back from origin of dorsal to lateral line; 3 scales between origin of anal and lateral line; 16 scales before dorsal; pectoral $2\frac{1}{2}$ in head and trunk; mandible 3 in head, measured from tip of lower jaw; least depth of caudal peduncle 3; ventral $1\frac{9}{10}$; snout 4 in head, measured from tip of upper jaw; eye $3\frac{1}{8}$; maxillary 3; interorbital space 3. Rakers 16 + 37, slender, fine, more or less subequal, and longest about $\frac{2}{3}$ of longest filaments which are $\frac{2}{3}$ of orbit. Lower lip with a fleshy cirrus on each side about half of orbit. In alcohol brassy-brown everywhere with more or less silvered reflections. Dorsal, caudal and pectoral dusted with dull brownish. Iris brownish. Length $6\frac{1}{2}$ inches (caudal damaged). Type.

Other examples in the collection are one from Pebas in eastern Peru, John Hauxwell; one from Para in Brazil, De Schulte Buckow; one identified as *Triportheus nematurus* from the Peruvian Amazon, Prof. James Orton, in the collection of 1873.

All the examples now before me show the following extent of variation: Head $3\frac{1}{2}$ to $4\frac{1}{2}$; depth $2\frac{4}{5}$ to $3\frac{1}{5}$; D. II or III, 8 to 10, usually 9, though sometimes 9 or 10; A. III or IV, 25, 1 to 29, 1, usually 27, 1, sometimes 26, 1 or 28, 1, and rarely 25, 1 or 29, 1; scales 30 to 34 in lateral line to base of caudal, usually 3 or 4 on latter; 6 or 7 scales obliquely back from origin of dorsal to lateral line, usually 6; 3 or 4 scales between

origin of anal and lateral line; 14 to 17 scales before dorsal, usually 15 or 16; snout 4 to $4\frac{2}{3}$ in head, measured from tip of upper jaw; eye $2\frac{2}{3}$ to $3\frac{2}{3}$; maxillary $2\frac{2}{3}$ to $3\frac{1}{3}$; length of depressed pectoral (mostly damaged) about $2\frac{1}{2}$ to 3; length of examples $3\frac{1}{2}$ to $6\frac{1}{4}$ inches.

Cope's figure, which however may not have been drawn from the specimen which is here restricted as the type, differs in having the abdominal profile more undulate, the absence of mandibular cirri, the radii of anal anteriorly much lower, and the adipose fin too small. The mandibular cirri are present in most every case examined, though in the adult they are much shorter and inconspicuous.

Granting Dr. Günther's argument concerning Agassiz's figure of *Chalceus angulatus*, it is reasonably certain that my specimens belong to that species.

Chalcinus brachipomus Valenciennes. Fig. 43.

Width of head 2 in its length; interorbital space $2\frac{1}{3}$ in head measured from tip of upper jaw. Body strongly compressed. Back rounded along edge. Preventral and postventral regions trenchant. Snout broad, surface convex, and rounded when viewed above. Teeth in

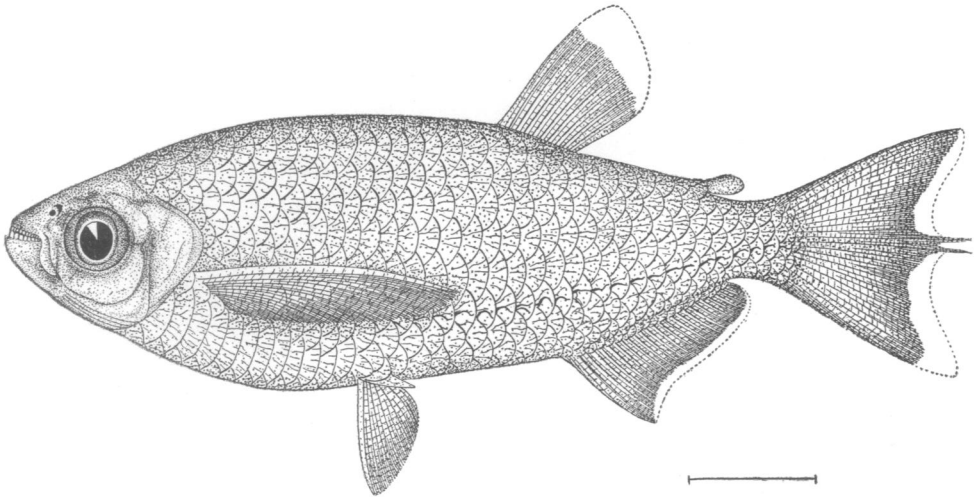


Fig. 43.—*Chalcinus brachipomus* Valenciennes.

upper jaw biserial, 3 median ones of inner series compressed and somewhat enlarged. Mandible with 5 teeth on side of each ramus anteriorly enlarged, and at symphysis 2 conical teeth. At least 2 small teeth on inner base of maxillary more or less concealed by lips. Tongue

thick, fleshy, pointed and tip little free. Interorbital space rather broad and evenly convex. Gill-opening forward to front of eye. Rakers 19 + 41, longest about $\frac{4}{7}$ of filaments which are $\frac{4}{7}$ of eye. Scales all well striated. Tubes in lateral line arborescent and rather long. Color in alcohol brassy-brown, back darker than lower surface. Upper surface of head brownish, sides and below pale or more brassy. Pectoral and dorsal dusted brownish, caudal paler. Ventral and anal whitish. Iris brassy-brown. Length $7\frac{1}{4}$ inches. Demarara River, British Guiana. E. D. Cope.

This species has apparently been confused, and it is not improbable that *Chalcinus rotundatus* (Jardine) may be found really the name applicable. Jardine's figure and account are, however, too crude and incomplete to permit of certain identification. In fact the anterior position of the dorsal fin as indicated by the figure would point more to *C. angulatus* (Agassiz). Under *C. brachipomus*, the statement "la dorsale est assez reculée sur la dos et presque opposée à l'anale qui est longue et basse" by Valenciennes, may perhaps be better referred to that designated as *C. brachypomus* by Dr. Günther. I see no reason for Prof. Garman indicating Dr. Günther's examples as identical with the one from the Amazons under a new name, which is afterwards accepted by Dr. and Mrs. Eigenmann. These latter writers, and also Prof. Ulrey, unite *Chalceus angulatus* Agassiz with *Chalcinus brachipomus* Valenciennes, a proceeding which I am unable to accept. The latter may be distinguished from the former by the more posterior insertion of the dorsal.

COSCINOXYRON gen. nov.

Type *Chalcinus culter* Cope.

Gill-rakers fine, long and numerous on first arch, about 90 to 100. Dorsal inserted well posteriorly, or about last third in length of head and trunk.

(Κόσκινον, sieve; ξύρον, razor; reference to the gill-rakers and cultrate body.)

Coscinoxyron culter (Cope).

Chalcinus culter Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 265, Pl. 14, fig. 3. Type, No. 16,672, A. N. S. P. Ambyiacu River. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 692. Peruvian Amazon. Prof. J. Orton.

Width of head $2\frac{3}{8}$ in its length; interorbital space $3\frac{1}{8}$ in head measured from tip of upper jaw. Body strongly compressed. Head well compressed, becoming constricted below. Surface of snout somewhat flattened above. Teeth a little small, those in upper

jaw crowded into 2 irregular series, inner a little larger, and all more or less tridentate. No maxillary teeth. Mandibular teeth uniserial, but little larger than those in upper jaw, and at symphysis 2 close behind outer series. Tongue slender, pointed, fleshy and little free. Interorbital space broad and convex. Gill-opening forward opposite anterior margin of eye. Rakers $30 + 65$, ciliiform, slender and longer than filaments or $\frac{4}{5}$ of eye. Color in alcohol plumbeous-brown on back, side and lower surface leaden, and side of head silvered. Fins all diluted brown, pectoral and caudal dusted with dull brownish dots, and median rays of latter all more or less deep brown. Iris brownish. Length 6 inches. Type.

The 2 examples from the Peruvian Amazon show: Head $3\frac{3}{4}$ to 4; depth $3\frac{1}{2}$; D. II, 9; A. IV, 28 or 29; scales about 40 (squamation injured) in lateral line to base of caudal, and 3 or 4 more on latter; about 8 scales (according to pockets) obliquely back from origin of dorsal to lateral line, and 3 between latter and origin of anal; about 23 to 25 (squamation injured) before dorsal; mandible $3\frac{1}{5}$ to $3\frac{1}{4}$ in head; snout $4\frac{2}{5}$ to $4\frac{3}{5}$ in head, measured from tip of lower jaw; eye $4\frac{1}{4}$ to $4\frac{1}{2}$; interorbital space $3\frac{2}{3}$ to $3\frac{1}{3}$; pectoral 3 in head and trunk; length of fishes (caudal damaged) $8\frac{7}{8}$ inches.

As with *Triportheus flavus* and *T. albus* Cope's figure does not show the mandibular cirrus, a character present in all of the examples of the present species, though smaller in the larger. The dark median basal blotch on the caudal is also not shown on his figure.

***Pseudocorynopoma doriae* Perugia.**

Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 86.
Jacuhy (Brazilian province of Rio Grande do Sul). H. H. Smith.

Head $3\frac{1}{2}$ to 4; depth $2\frac{3}{5}$ to 3; D. II, 9; A. IV or V, usually V, 30, 1 to 39, 1, usually 34, 1, frequently 32, 1 or 35, 1, and only seldom 30, 1 or 39, 1; scales 33 to 40 in lateral line to base of caudal and usually 1 or 2 more on latter; 7 or 8 scales obliquely back from origin of dorsal to lateral line; 6 to 8 scales, usually 7, between origin of anal and lateral line in a vertical series; 16 to 21 scales before dorsals, though usually 18 or 19; snout $3\frac{3}{4}$ to $4\frac{1}{4}$ in head, measured from tip of upper jaw; eye 3 to $3\frac{1}{4}$; maxillary $2\frac{1}{6}$ to $2\frac{1}{5}$; interorbital space $2\frac{1}{4}$ to 3; pectoral $2\frac{3}{5}$ to $3\frac{1}{5}$ in head and trunk; length of body (caudals damaged) $1\frac{3}{4}$ to $2\frac{1}{2}$ inches. In all 17 examples.

Some, apparently females, do not appear to have the dorsal much enlarged, and the anal also smaller. Fully developed males show the distal end of each elongated anterior anal ray with a single series of small tubercles, evidently a character of breeding.

Subgenus *GASTROPELECUS* Bloch.

Upper anterior profile straight.

***Gasteropelecus sterniela* (Linnaeus).**

Head $3\frac{1}{2}$; greatest depth $1\frac{5}{8}$; D. II, 8; A. III, 30; scales 30? (squamation injured) in a lateral series from gill-opening above to base of caudal; about 18 scales before dorsal; 13 scales in a transverse series between origin of dorsal and that of anal; 17? scales from gill-opening at origin of pectoral to that of ventral; width of head about 2 in its length; mandible $2\frac{1}{3}$; snout $4\frac{1}{8}$ in head measured from tip of upper jaw; eye $3\frac{1}{5}$; interorbital space $2\frac{1}{4}$. Length $2\frac{3}{16}$ inches. Surinam. Bonaparte Coll. (No. 456.) Dr. T. B. Wilson.

THORACOCCHARAX subgen. nov.

Type *Gasteropelecus stellatus* Kner.

Anterior profile of back convex.

(*Θωραξ*, cuirass; *χαράξ*, Charax.)

***Gasteropelecus stellatus* Kner.**

Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Pebas, Eastern Peru. John Hauxwell.—Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 265. Ambyiacu River. John Hauxwell.

Head $3\frac{1}{4}$ to $3\frac{3}{4}$; depth $1\frac{3}{8}$ to $1\frac{7}{8}$; D. II, 12 to II, 15, usually II, 13; A. III, 35 to III, 39; scales (squamation damaged) 18? to 20 in a lateral series from gill-opening to base of caudal; pectoral (damaged) about $1\frac{1}{5}$ to 2 in head and trunk; eye 3 in head, measured from tip of upper jaw; interorbital space 2 to $2\frac{3}{8}$; total length of 7 fish $1\frac{5}{16}$ to $3\frac{1}{8}$ inches. Pebas, eastern Peru, and the Ambyiacu River. John Hauxwell.

CHARACINÆ.

***Asiphonichthys sternopterus* Cope.**

Amer. Nat., XXVIII, 1894, p. 67. Type, No. 21,559, A. N. S. P. Upper waters of the Jacuhy River, in the Brazilian State of Rio Grande do Sul. H. H. Smith.—Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 85, Pl. 5, fig. 2. Type.

Width of head $2\frac{1}{4}$ in its length; interorbital space $3\frac{3}{8}$. Body strongly compressed, edges rather rounded. Postdorsal region a little broad and preventral quite so. Postventral region well compressed. Head well compressed. Snout broader than long, and surface convex. Mouth broad. Mandible with rami not elevated inside of mouth. Teeth in jaws small, irregularly biserial in upper, and with several short canines. Mandibular teeth in front of jaw a little enlarged and with at least 4 more or less developed canines. Maxillary with a series of fine teeth along most of its edge. Interorbital space a little

broad and convex. Gill-opening forward about opposite front rim of pupil. Rakers II, 4 + 6, II, rather thick and a trifle more than orbit. Filaments $\frac{3}{8}$ of orbit. Scales not striated. Color in alcohol brownish with more or less silvery reflections. A narrow pale or grayish streak from shoulder to base of caudal. A grayish blotch size of pupil at shoulder, and a brownish tint at base of caudal medianly. Fins all plain pale brownish. Iris brassy-brown. Length $3\frac{3}{16}$ inches (caudal damaged).

This example shows the anal rather more enlarged anteriorly than Cope's figure, and also the scales more evenly enlarged in the costal region.

Charax gibbosus (Linnæus).

Head $3\frac{7}{8}$; depth $2\frac{9}{10}$; D. II, 9; A. II, 51; snout $3\frac{1}{2}$ in head, measured from tip of upper jaw; eye $3\frac{1}{2}$; maxillary $1\frac{3}{4}$; interorbital space $3\frac{3}{4}$; least depth of caudal peduncle $3\frac{1}{2}$. Surinam. Dr. Charles Hering. A single small example in poor preservation about 3 inches long.

The genus *Charax* Scopoli as here understood has *Salmo gibbosus* Linnæus as its type.

Charax tectifer (Cope).

Anacyrtus tectifer Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 565. Type, No. 8,175, A. N. S. P. Pebas, Equador. John Hauxwell.

Anacyrtus sanguineus Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 266, Pl. 9, fig. 1. Cotypes, Nos. 8,176 (type) to 8,186, A. N. S. P. Ambyiacu River. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 686. Peruvian Amazon. Prof. J. Orton.

Head $3\frac{1}{2}$; depth 3; D. II, 9; A. III, 42, this fin damaged posteriorly, a fact overlooked apparently by Cope, which would thus account for "A. 37"; P. I, 12?; V. I, 7; scales about 46? (squamation injured) in course of lateral line to base of caudal; there are also probably 12? scales between lateral line and origin of anal, instead of 10 as noted by Cope; width of head $2\frac{3}{8}$ in its length; depth of head, over middle of orbit, about $1\frac{3}{4}$; snout 4; eye $3\frac{1}{2}$; maxillary $1\frac{3}{4}$; interorbital space $3\frac{1}{2}$; mandible $1\frac{3}{4}$; least depth of caudal peduncle $3\frac{3}{8}$. The other characters do not appear to me to differ from those of *Anacyrtus sanguineus* Cope. The palatine teeth(?) are obsolete, due possibly to preservation. Coloration, as described by Cope, also agrees with *A. sanguineus*. Further, it may be stated that the anterior free margins of the nasal bones are not more prolonged than in *A. sanguineus*, and overhang the nostrils in a similar manner. Type of *Anacyrtus tectifer* Cope.

The cotypes of *Anacyrtus sanguineus* Cope show: Head $3\frac{1}{4}$ to $3\frac{3}{8}$; depth $2\frac{3}{8}$ to 3; D. II, 9; A. IV, 39, I to IV, 41, I; scales 46 to 52 in lateral

line to base of caudal with apparently several more on latter; 12 scales obliquely back from origin of dorsal to lateral line; 12 scales between lateral line and origin of anal; snout $3\frac{1}{2}$ to 4 in head; eye 3 to $4\frac{2}{5}$; maxillary $1\frac{1}{2}$ to $1\frac{3}{4}$; interorbital space $3\frac{2}{3}$ to 4; pectoral $1\frac{2}{5}$ to $1\frac{3}{5}$; ventral $1\frac{2}{5}$ to $1\frac{3}{4}$; total length of body $1\frac{11}{16}$ to $4\frac{1}{4}$ inches.

Young examples differ somewhat from the adult. The scales on the back are much smaller and crowded in appearance. The origin of the anal begins but a trifle behind that of the dorsal in the vertical, and the anterior portion of the fin is deep. Ventral reaches well beyond origin of anal. The maxillary falls a little short of the posterior orbital margin.

Cope's figure is evidently a little faulty in that the origin of the anal is opposite that of the dorsal, and the spine on the shoulder-girdle in front of the base of the pectoral is omitted.

CYRTOCHARAX gen. nov.

Type *Anacyrtus limæsquamis* Cope.

Scales rough, very small or about 100 or more in lateral line. No palatine teeth.

Related to *Charax* Scopoli.

(Κυρτός, crooked; χαράξ, Charax; with reference to the form of the body.)

Cyrtocharax limæsquamis (Cope). Fig. 44.

Anacyrtus limæsquamis Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 686. Cotypes, Nos. 21,460 (type) and 21,461, A. N. S. P. Peruvian Amazon. Prof. J. Orton.

Width of head $2\frac{1}{4}$ in its length; interorbital space 3. Body strongly compressed, edges rounded and breast broad. Head compressed. Snout broadly convex. Teeth in upper jaw and front of mandible mostly enlarged, those of former biserial with inner larger. Maxillary teeth and those on mandible laterally minute and crowded or numerous. No palatine teeth. Interorbital space convex. Gill-opening forward nearly opposite anterior margin of orbit. Rakers iv, 2 + 7, lanceolate, robust and almost equal orbit. Filaments about $\frac{2}{3}$ of orbit. Tubes of lateral line simple. Vent close in front of anal. Color in alcohol brownish, greenish evidently copper stain. A broad brassy shade from gill-opening above to caudal. Fins all brownish without markings. Iris brownish. Length $8\frac{1}{2}$ inches (caudal damaged). Type.

The other example shows: Head $3\frac{1}{3}$; depth $2\frac{1}{2}$; D. II, 9; A. IV, 39, 1; scales about 96 in lateral line to base of caudal, and about 5 more

on latter; snout $2\frac{1}{4}$ in head; eye $4\frac{1}{4}$; maxillary $1\frac{1}{3}$; interorbital space $2\frac{9}{10}$; pectoral $1\frac{3}{8}$; ventral $1\frac{1}{4}$; least depth of caudal peduncle $3\frac{3}{4}$.

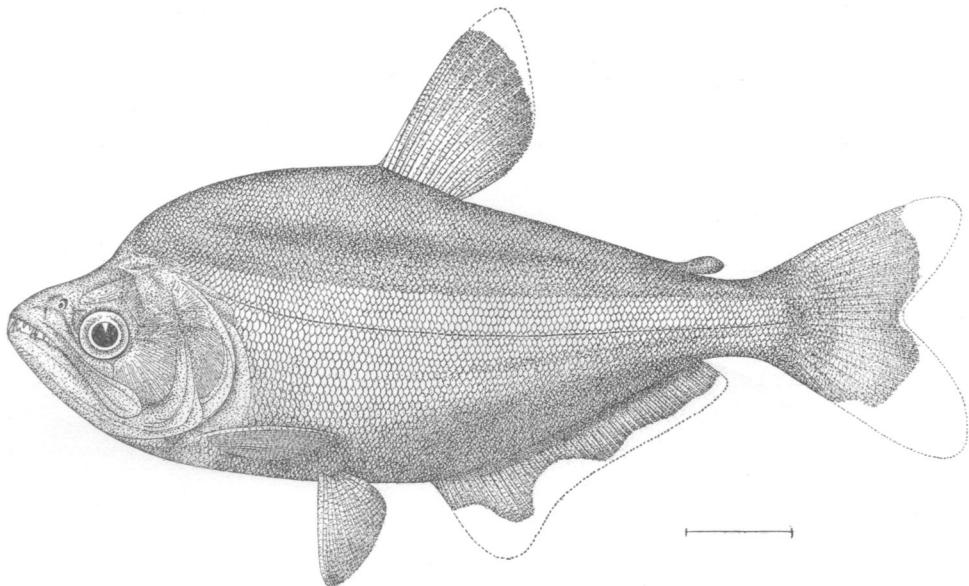


Fig. 44.—*Cyrtcharax limasquamis* (Cope).

In this specimen the pectoral reaches first third of length of ventral, which latter reaches anal, and the humeral and caudal blotches are more distinct. Length $5\frac{1}{8}$ inches (caudal damaged).

Subgenus RÆBOIDES Günther.

Ræboides myersii (Gill). Fig. 45.

Ræboides myersii Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 265. Ambyiacu River. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 686. Peruvian Amazon. Prof. J. Orton.

Width of head $2\frac{1}{10}$ in its length; interorbital space $3\frac{1}{5}$. Body deeply compressed, and edges of back and caudal peduncle rounded. Pre-ventral region rather broadly flattened. Postventral region with a median low keel. Head well compressed. Snout much broader than long, and surface convex. Each jaw with 4 external short conic denticles, outer pair of upper on each side with 1 or 2 smaller denticles between. Teeth of upper jaw short, subequal, conic and more or less irregularly biserial, with inner series widely separated. Teeth of mandible small, canines 4, and median pair close together at sym-

physis. Greater portion of maxillary basally with a jagged denticulate edge. Tongue fleshy, triangular and little free in front. Interorbital space convex. Gill-opening forward opposite anterior margin of eye. Rakers $9 + 15$, lanceolate, a little longer than filaments or $\frac{4}{5}$ of eye. Scales striate. Tubes of lateral line simple. Vent close in front of anal. Color in alcohol olivaceous-brown, greenish tint probably due to copper in preservative, and back a little darker. Fins all brownish, bases of pectoral, ventral and caudal with a little dusky

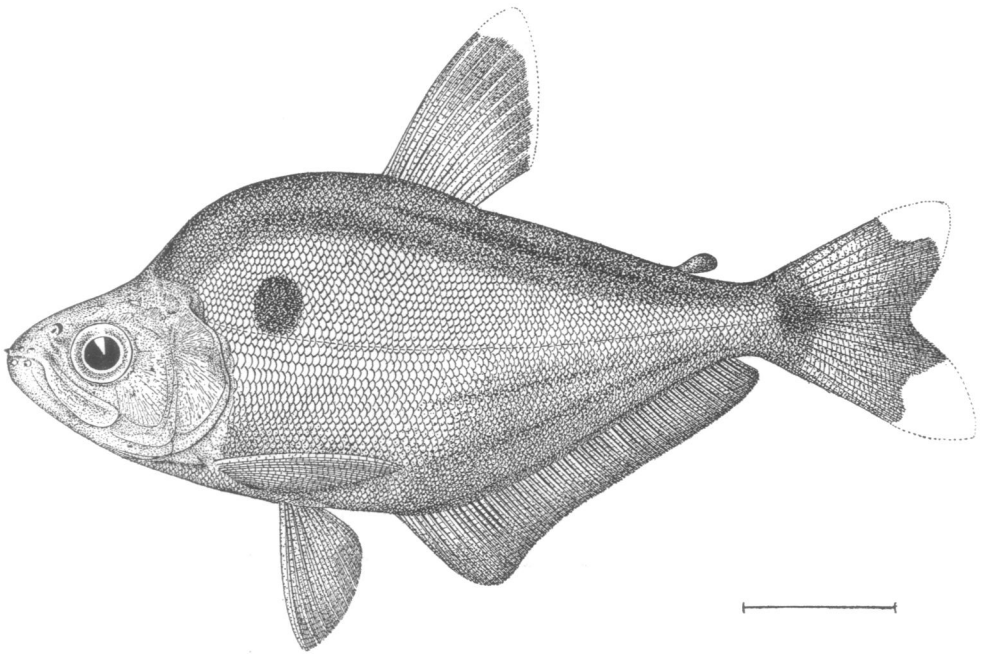


Fig. 45.—*Ræboides myersi* (Gill).

tint. A dusky humeral blotch above lateral line about size of orbit, and also one of same shade on base of caudal, though both rather indistinct. Iris dusky-reddish. Length $6\frac{3}{8}$ inches (caudal damaged). Three from the Peruvian Amazon.

The 3 examples from the Ambyiacu show: Head $3\frac{1}{5}$ to $3\frac{2}{5}$; depth $2\frac{2}{5}$ to $2\frac{3}{4}$; D. II, 9, rarely II, 8; A. IV, 47, 1 to 52, 1, frequently 49, 1; scales about 84 to 86 in lateral line to base of caudal; snout $3\frac{1}{2}$ to 4 in head; eye $3\frac{1}{10}$ to $3\frac{3}{4}$; maxillary $1\frac{1}{2}$ to $1\frac{7}{8}$; interorbital $3\frac{1}{8}$ to $3\frac{4}{7}$; pectoral $1\frac{1}{5}$ to $1\frac{1}{3}$; ventral $1\frac{3}{5}$ to $1\frac{1}{4}$; total length of body (caudals mostly damaged) $3\frac{1}{3}$ to $6\frac{1}{2}$ inches.

CYNOCHARAX subgen. nov.

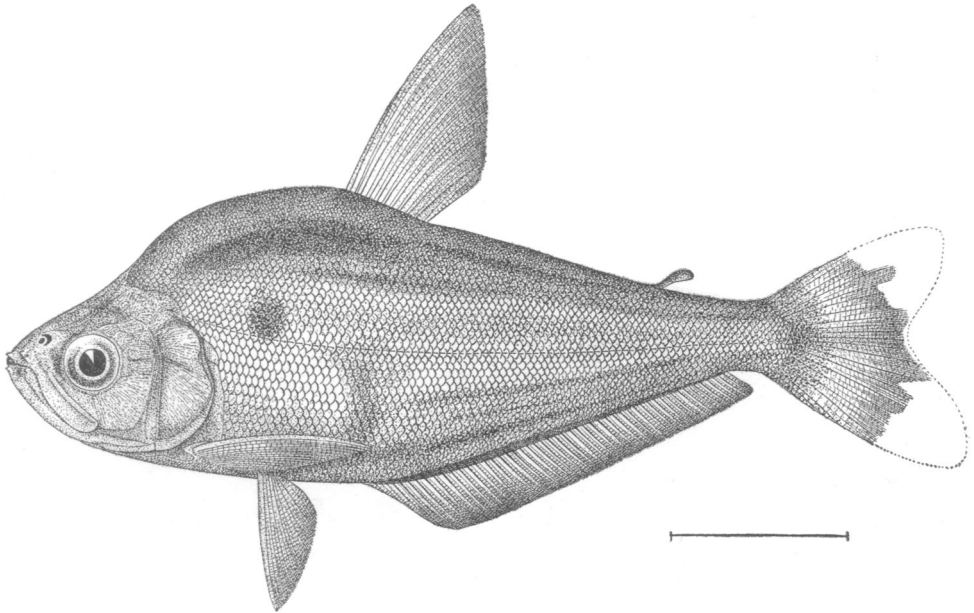
Type *Anacyrtus affinis* Günther.

For those species with well-developed canines in the upper jaw.

(Κύων, dog; χαραξ, Charax.)

Ræboides affinis (Günther). Fig. 46.*Ræboides rubrivertex* Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 265.Type, No. 8,190, A. N. S. P. Between the mouth of the Peruvian Amazon or Ucayale river. Robert Perkins.—Cope, *l.c.*, p. 292.

Width of head 2 in its length; interorbital space 3. Body compressed strongly and edges of back rounded. Preventral region rather broad and flattened. Postventral region with a slight median keel or somewhat trenchant. Head well compressed. Snout broadly convex,

Fig. 46.—*Ræboides affinis* (Günther).

much broader than deep. Upper jaw with 6 external teeth, and 1 on outside near base of each maxillary. Mandible with 4 external teeth. Upper jaw with 2 series of teeth of about equal size, posterior not confluent anteriorly. Mandibular teeth uniserial, with 4 canines, pair at symphysis close together. Maxillary with upper $\frac{2}{3}$ of its edge finely denticulated. No palatine teeth. Tongue fleshy, triangular and free. Interorbital space convex. Gill-opening forward about

opposite posterior nostril. Rakers $10 + 14$, lanceolate, and longest about $\frac{2}{3}$ of orbit or about equal to longest filaments. Scales all more or less striate. Tubes in lateral line simple. Color in alcohol brown, lower surface little paler, and body everywhere more or less silvered. Fins all pale brown, without markings, and a brownish blotch on anterior anal rays. An indistinct or grayish blotch above and on lateral line, well behind shoulder, about size of orbit, and another at base of caudal. A brassy shade from gill-opening above broadly back over side. Iris reddish-brown, pale below. Length $5\frac{1}{4}$ inches (caudal damaged). Type of *Ræboides rubrivertex* Cope.

***Ræboides bicornis* Cope. Fig. 47.**

Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 564, fig. (teeth). Type, No. 8,151, A. N. S. P. Pebas, Eastern Equador. John Hauxwell.

Width of head $3\frac{2}{5}$ in its length; interorbital space $3\frac{1}{7}$. Body strongly compressed. Head well compressed. Snout about as broad as long. External denticles well developed, 2 median large and directed for-

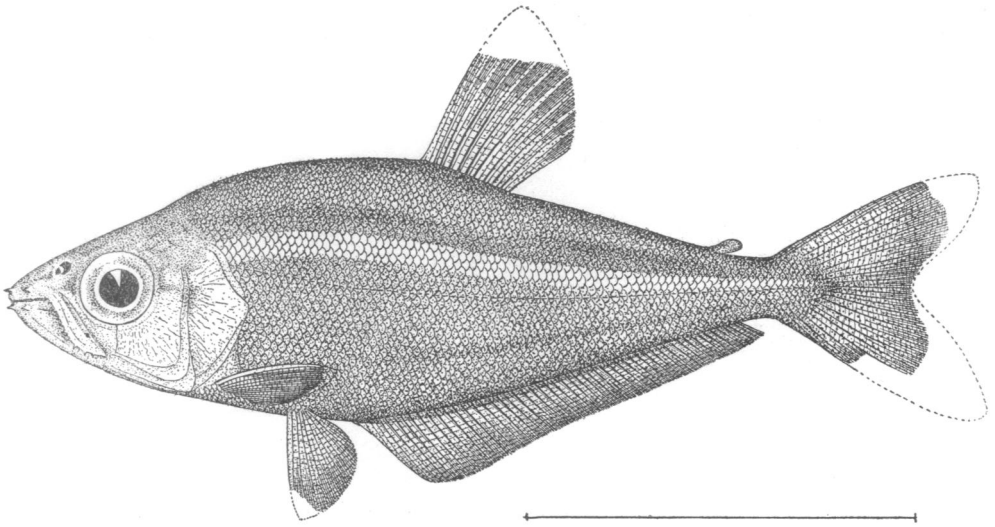


Fig. 47.—*Ræboides bicornis* Cope.

wards, 2 lateral subequal on upper jaw, and 4 mandibulars equally placed. On each side of upper jaw a well-developed canine, and 2 series of smaller similar teeth between or in front, other teeth all smaller and uniserial. Small teeth in mandible with 4 canines, anteriorly median pair close or at symphysis. Maxillary with a number of large denticles of rather irregular size. Tongue long, slender and

little free. Interorbital space convex, and moderately broad. Gill-opening forward to front rim of orbit. Rakers 6 + 9, slender, pointed, a little shorter than longest filaments which are nearly as long as orbit. Tubes in lateral line simple. Color in alcohol faded brownish, lower surface paler, and everywhere with more or less silvered reflections. Fins pale or nearly uniform brownish. Length $2\frac{1}{2}$ inches (caudal damaged). Type.

Cynopotamus gulo Cope. Fig. 48.

Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 565.
Cotypes, Nos. 8,053 (type) to 8,055, A. N. S. P. Pebas, Eastern Peru.
John Hauxwell.

Width of head $3\frac{1}{3}$ in its length; interorbital space 4. Body strongly compressed. Head strongly compressed. Snout long as broad. Teeth in upper jaw uniserial, 4 enlarged canines, and several a little smaller laterally as median pair of former are close together. About 10 canines in mandible, 5 on each side anteriorly, and subequally large.

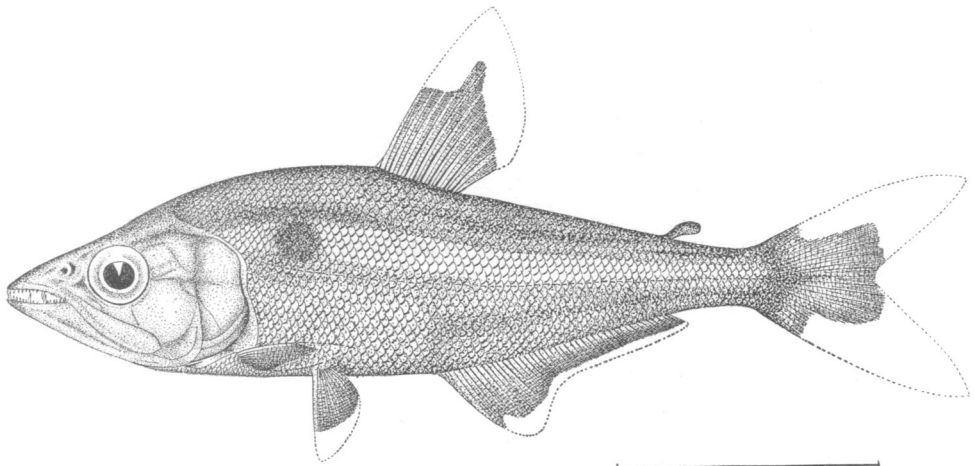


Fig. 48.—*Cynopotamus gulo* Cope.

Other teeth all small like those on maxillary, though forming 2 series anteriorly. Tongue small, fleshy, rounded in front and little free. Interorbital space broad and little convex. Gill-opening forward about front margin of pupil. Rakers iv, 2 + 7, ii, lanceolate, and much longer than filaments or $\frac{3}{4}$ of orbit. Lateral line of simple tubes. Color in alcohol brownish. A more or less narrow leaden streak from shoulder to base of caudal, with a slightly dusky blotch at humeral region and one at base of caudal. Abdomen showing through pale

brownish. Head more or less silvered. Fins uniform dark brownish. Iris dark brownish. Length $3\frac{5}{16}$ inches (caudal damaged). Type.

Two larger examples in good preservation show: Head $3\frac{2}{3}$ and $3\frac{1}{3}$; depth $3\frac{1}{3}$ and 3; D. II, 9; A. v, 41, I and v, 39, I; P. I, 15 and I, 14; V. II, 7; scales about 76 or 77 in lateral line to base of caudal, and about 5 or 6 more on latter; about 16 scales obliquely back from origin of dorsal to lateral line; about 20 scales between origin of anal and lateral line; about 46 or 47 scales before dorsal; 8 scales obliquely back from origin of adipose dorsal; width of head $2\frac{3}{8}$ and $2\frac{1}{10}$ in its length; depth of head $1\frac{4}{7}$ and $1\frac{3}{8}$ over posterior margin of orbit; snout 3; eye $4\frac{1}{2}$ and $4\frac{3}{8}$; maxillary $1\frac{1}{2}$ and $1\frac{4}{7}$; mandible $1\frac{4}{7}$ and $1\frac{1}{2}$; interorbital space 3; base of dorsal $2\frac{3}{8}$ and $2\frac{1}{3}$; least depth of caudal peduncle $3\frac{2}{8}$ and $3\frac{3}{8}$; total length of specimens (caudal damaged) $6\frac{7}{8}$ and $7\frac{1}{8}$ inches respectively. Pebas, Peru. John Hauxwell.

This species will fall within my subgenus *Eucynopotamus*, with the scales a little large, about 75 in the lateral line.

***Aeostorhamphus hepsetus* (Cuvier).**

Xiphorhamphus hepsetus Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 85. Brazilian province of Rio Grande do Sul. H. H. Smith.

Head $3\frac{1}{4}$; depth $3\frac{3}{8}$ to $3\frac{3}{4}$; D. II, 9; A. v, 24, I to v, 26, I; scales about 76 in lateral line to base of caudal and several more on latter; snout $2\frac{5}{8}$ to $3\frac{1}{10}$ in head; eye $4\frac{1}{2}$ to $5\frac{1}{3}$; maxillary $1\frac{3}{8}$ to $1\frac{3}{4}$; interorbital space 5; pectoral $1\frac{1}{3}$ to $1\frac{1}{2}$; ventral $1\frac{7}{8}$ to 2; least depth of caudal peduncle $3\frac{1}{8}$ to 4; gill-rakers v or vi, 2 or 3 + 8 or 9, and II to IV. Two examples.

SPHYRÆNOCHARAX subgen. nov.

Type *Xiphorhamphus abbreviatus* Cope.

Body rather deep, $3\frac{1}{2}$ to 4.

(Σφύρανα, Sphyræna; χαράξ, Charax.)

***Aeostorhynchus brachycephalus* (Cope).**

Xiphorhamphus brachycephalus Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894 (January 5), p. 84, Pl. 4, fig. 1. Cotypes, Nos. 21,728 (type) and 21,917, A. N. S. P. Brazilian province of Rio Grande do Sul. H. H. Smith.

Width of head 2 in its length; interorbital space 4. Body compressed and edges all more or less rounded. Head compressed. Snout convex and a little broader than long. Teeth on palatines uniserial, little smaller than those along maxillary and side of mandible where compressed. Canines 4 in front of each jaw, at symphysis, not close. Tongue triangularly pointed and free. Interorbital space a little convex. Gill-opening forward opposite posterior nostril. Rakers

iv, 6 + 11, iv, pointed, longest $\frac{3}{4}$ of filaments which are $\frac{3}{8}$ of orbit. Each scale with several fine striæ. Color in alcohol brownish, sides brassy or silvered. Back a little darker than other portions. Fins all brownish, dorsal and caudal a little darker. A large blackish blotch, a little larger than iris, at base of caudal and extending out on middle caudal rays. An indistinct grayish humeral blotch. Iris brownish, a little darker above. Length $6\frac{2}{3}$ inches (caudal damaged). Type.

Other example shows: Head $3\frac{1}{3}$; depth $3\frac{1}{3}$; D. II, 9; A. IV, 25, 1; scales about 55 in lateral line to base of caudal, and 4 more on latter; snout $3\frac{2}{3}$; eye 4; maxillary $1\frac{2}{3}$; interorbital space $4\frac{1}{6}$.

Acestrorhynchus abbreviatus (Cope). Fig. 49.

Xiphorhamphus abbreviatus Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 687. Cotypes, Nos. 21,532 (type), 21,105 to 21,107, and 21,982 and 21,983, A. N. S. P. Peruvian Amazon. Prof. J. Orton.

Width of head $2\frac{1}{2}$ in its length; interorbital space $3\frac{1}{3}$. Body well compressed, and edges of body rounded except thorax, which has a

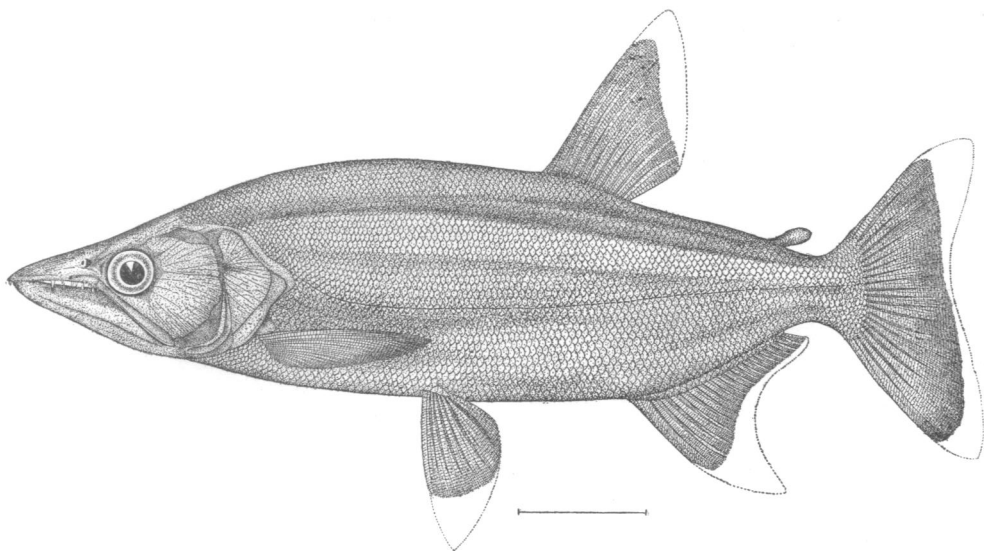


Fig. 49.—*Acestrorhynchus abbreviatus* (Cope).

large median keel. Postdorsal region, and both upper and lower surfaces of caudal peduncle, somewhat flattened and level. Head compressed. Snout a trifle longer than wide. Teeth in jaws rather irregular canines, about 6 well developed in upper and 8 in lower. Other teeth small, those on rami of mandible posteriorly fine, and

similar to those extending whole length of bone. A long series of still finer palatine teeth. Interorbital space broad and a trifle convex. Gill-opening forward opposite anterior nostril. Rakers 8 + 10 rudimentary denticles. Filaments $\frac{3}{4}$ of orbit. Tubes in lateral line simple. Vent shortly before anal fin. Color in alcohol brownish-brassy, back a little darker than rest of body and with some metallic greenish tints. Fins all pale greenish-brown, each one more or less grayish or pale dusky marginally. Base of caudal with a blackish blotch a little less than orbit. Adipose fin brownish. Iris mostly dark brownish, reddish below. Length $8\frac{3}{8}$ inches (caudal damaged). Type.

The others show: Head 3 to $3\frac{1}{2}$; depth $3\frac{1}{2}$ to 4; D. II, 9; A. V, 20, 1 to V, 24, 1; scales about 80 to 95 in lateral line to base of caudal, and about 5 more on latter; snout 3 in head; eye $4\frac{1}{2}$ to $5\frac{1}{2}$; maxillary $1\frac{1}{2}$ to $1\frac{3}{4}$; interorbital space $3\frac{1}{2}$ to $3\frac{3}{4}$; least depth of caudal peduncle $4\frac{1}{8}$ to $4\frac{3}{8}$; length of body $5\frac{1}{4}$ to $8\frac{1}{4}$ inches.

Subgenus *ACESTRORHYNCHUS* Eigenmann.

Body elongate, depth 6 or 7.

Acestrorhynchus falcistrostris (Cuvier).

Xiphorhamphus falcistrostris Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 688. Peruvian Amazon. Prof. J. Orton.

Head $3\frac{1}{8}$ to $3\frac{1}{4}$; D. II, 9; A. V, 21, 1; width of head $3\frac{3}{8}$ to $3\frac{3}{4}$ in its length; snout $2\frac{1}{4}$ to $2\frac{3}{4}$; eye $4\frac{3}{4}$ to $5\frac{1}{5}$; maxillary $1\frac{3}{4}$ to $1\frac{1}{2}$; interorbital space $3\frac{3}{4}$ to 5; least depth of caudal peduncle 5; length (caudals damaged) $6\frac{1}{2}$ to 11 inches. Two examples from the collections of 1873 and 1877.

Acestrorhynchus heterolepis (Cope). Fig. 50.

Xiphorhamphus heterolepis Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 687. Cotypes, Nos. 21,246 (type) to 21,248, A. N. S. P. Peruvian Amazon. Prof. J. Orton.

Width of head $3\frac{1}{8}$ in its length; interorbital space $3\frac{1}{2}$. Body compressed, edges rounded and upper and lower surfaces of caudal peduncle bevelled. Chest with a median keel. Head well compressed. Snout convex above, and its width $1\frac{3}{8}$ in its length. Teeth along edges of jaws uniserial above, 2 canines at tip in front, midway in length of snout a large canine on each side a little inside, and 3 more between it and front of eye becoming larger as they progress back. In mandible 4 canines at symphysis, all well separated, and second pair largest. Just behind second pair 1 or 2 small teeth, then 3 enlarged canines middle of which is largest, and then follows a single series of small teeth like those along edge of maxillary. A single long series

of small pointed palatine teeth. Tongue conic, elongate and free. Interorbital space a little convex. Gill-opening forward opposite front margin of eye. Rakers absent, edge of first branchial arch trenchant and finely asperous, with about $21 + 37$ finely asperous laminae externally. Filaments $\frac{4}{7}$ of eye. Tubes in lateral line at least bifurcate. Color in alcohol brownish, greenish tints evidently due to copper, and with brassy reflections. Fins unmarked, except

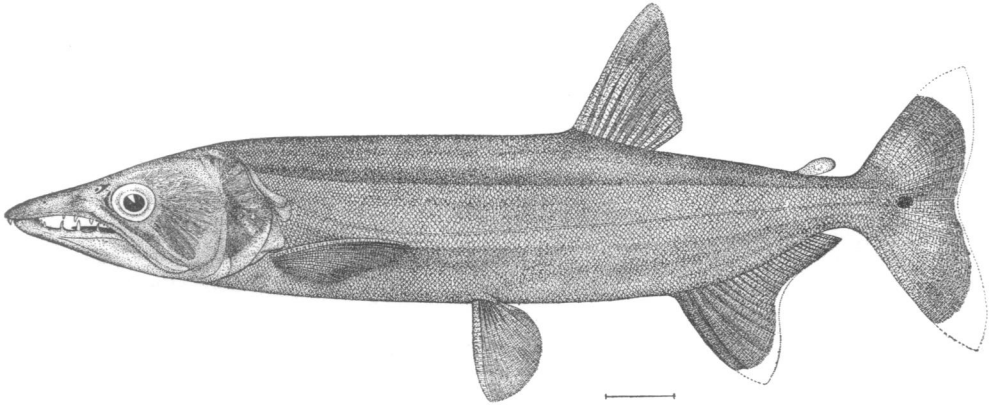


Fig. 50.—*Acestrorhynchus heterolepis* (Cope).

base of caudal, which has a black spot medianly about size of pupil. Iris brown. Length $14\frac{1}{2}$ inches (caudal damaged). Type.

The other examples show: Head $3\frac{1}{8}$ to $3\frac{1}{2}$; depth 5 to 6; D. II, 9; A. V, 23 or 24, 1; scales about 120 to 130 in lateral line to base of caudal; snout $1\frac{1}{2}$ to $2\frac{1}{7}$ in head; eye $5\frac{1}{8}$ to $5\frac{1}{2}$; interorbital space $4\frac{1}{2}$ to $5\frac{1}{4}$; least depth of caudal peduncle $5\frac{1}{8}$ to $5\frac{1}{2}$; length (caudal damaged) $7\frac{3}{8}$ to $10\frac{1}{4}$ inches.

***Xiphostoma maculatum* Valenciennes.**

Xiphostoma taedo Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 267, Pl. 13, fig. 2. Cotypes, Nos. 7,958 (type) and 7,959, A. N. S. P. Ambyiacu River. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 688. Peruvian Amazon. Prof. J. Orton

Width of head $4\frac{2}{3}$ in its length; interorbital space $5\frac{1}{4}$. Body well compressed and edges rounded. Head broad and flattened, sides becoming constricted below. Snout depressed above, a little flattened. Teeth in jaws uniform, uniserial and recurved. A rather broad finely asperous tract on each palatine. Tongue triangular and not free. Interorbital space broad and flat. Most osseous areas on head rugosely striate. Gill-opening forward opposite anterior margin of orbit.

Rakers v, 2 + 7, vi, lanceolate, and much shorter than filaments, which are about half of eye. Color in alcohol brownish, color of back well separated from paler color of lower surface, and without markings. Tip of snout brownish. Fins all pale brownish, bases of caudal lobes with pale brownish bars. Faded marks or traces of bars, as indicated by Cope, are evident. Iris brassy. Length $7\frac{3}{4}$ inches (caudal damaged). Type.

The others show: Head $2\frac{3}{8}$ to $2\frac{7}{8}$; depth $6\frac{1}{4}$ to 8; D. II, 8; A. III, 8, 1; scales 77 to 80 in lateral line to base of caudal, and several more on latter; snout $1\frac{2}{3}$ to $1\frac{4}{5}$ in head; eye $8\frac{3}{8}$ to $9\frac{3}{4}$; interorbital space $4\frac{3}{4}$ to $5\frac{3}{4}$; least depth of caudal peduncle $4\frac{2}{5}$ to 6; length $7\frac{1}{8}$ to $12\frac{3}{8}$ inches (caudal damaged).

BELONCHARAX gen. nov.

Type *Beloncharax beani* sp. nov.

Related to *Boulengerella* Eigenmann, but differing in the larger scales, which are about 50, while in the latter they are about 88. Lateral line incomplete.

(Βελόνη, Belone, the Old World Gar; χαραξ, Charax.)

Beloncharax beani sp. nov. Fig. 51.

Head $2\frac{4}{5}$; depth 7; D. II, 8; A. III, 8, 1; P. I, 18; V. I, 7; scales in lateral line, or those with tubes, 27, and count continued to base of caudal 18, also 5 more on latter; 5 scales obliquely forward from origin of dorsal to lateral line; 8 scales obliquely back from origin of adipose fin to lower surface of caudal peduncle; 5 scales obliquely forward from origin of ventral to lateral line; 35 scales before dorsal; width of head $3\frac{3}{4}$ in its length; depth of head at posterior edge of preopercle $2\frac{3}{4}$; snout $2\frac{1}{8}$; eye $8\frac{3}{4}$; tip of snout to posterior extremity of maxillary $1\frac{2}{3}$; mandible $1\frac{2}{3}$; interorbital space 5; second dorsal ray $2\frac{4}{7}$; third anal ray 3; least depth of caudal peduncle $4\frac{1}{4}$; pectoral $2\frac{2}{5}$; ventral $3\frac{1}{4}$.

Body long, rather slender, well compressed, trunk of more or less even depth, and middle of back evidently levelled but without any distinct keels on each side above. Lower edges of body evidently rounded. Postdorsal, postadipose dorsal and postanal edges of body flattened a trifle, and edge on each side a rather obsolete keel. Caudal peduncle well compressed, its length about $\frac{2}{3}$ its least depth.

Head long, attenuate, or in a long triangle, well compressed, flattened or rather broadened above, and sides becoming constricted somewhat below. Jaws long, tapering, robust, rather depressed, upper project-

ing, flattened towards tip, pyramidal, and mandible rather broader with convex surface or of swollen appearance. Profile of snout a little convex at first, then merging into nearly straight upper profile of head. Profile of mandible at first a little concave, then a little convex. Eye a little posterior in head, high, and a trifle longer than deep. Mouth forming a slight arch. Lips not evident except as a narrow cutaneous fold along margin of mandible. Maxillary narrowly exposed oblique, and extending distal extremity posteriorly till about opposite posterior margin of pupil. Edge of maxillary with fine teeth. Tip of upper jaw a hard or tough point. Teeth in jaws uniserial, rather small, of more or less equal size, compressed or cultrate, crowded one after the other and all directed backwards. When jaws close upper teeth slip over sides of mandibular. In front of upper jaw a Λ -shaped patch of conic teeth progressing in size to outermost, which is

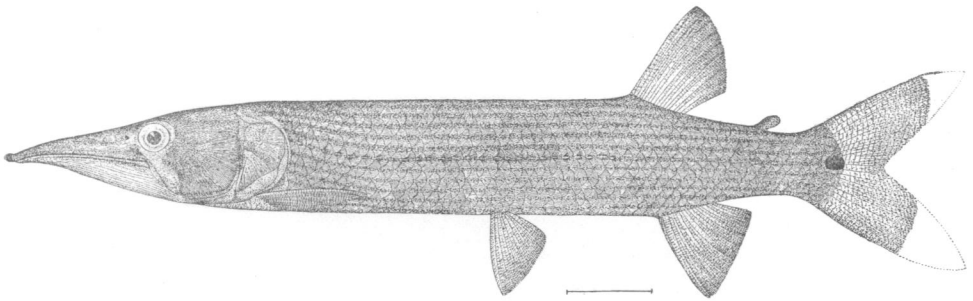


Fig. 51.—*Belonocharax beani* Fowler.

thus canine-like. There are also several other smaller conic teeth still exterior to latter. No teeth at symphysis of mandible. On roof of mouth near front of upper jaw on each side, a short series of several rather irregular small denticles. Buccal membranes broad, reaching first $\frac{2}{3}$ in length of jaws. Tongue flattened, free, rounded as viewed from above, and its tip falling about last $\frac{2}{3}$ in length of snout. Bones of head all more or less finely rugose-striate. Opercular flap rather broad.

Gill-opening extending forward about opposite anterior margin of pupil. Gill-rakers about $8 + 11$ short denticles, longest barely more than half of pupil. Filaments about $\frac{3}{4}$ of orbit. Isthmus narrow, slender, edge rounded. Bones of shoulder-girdle, where exposed, with slight striæ.

Scales large, of more or less uniform size, each one striate and ctenoid. Scales on breast and bases of caudal and anal smaller than

those on body. Ventral with a small axillary scale. Lateral line, incomplete, midway on side, starting from shoulder, of simple tubes, and ending about 2 scales before origin of dorsal.

Dorsal inserted well posterior or near last $\frac{2}{3}$ in head and trunk, and second ray evidently highest, others graduated down. Adipose fin placed in last third of space between origin of dorsal and base of caudal, and its length a little less than eye. Anal inserted behind middle of base of dorsal, or nearer base of caudal than that of ventral, and third ray longest, or others graduated down. Caudal forked, lobes pointed. Pectoral reaching less than half way to ventral. Ventral a little more than half way to anal. Vent close in front of anal.

Color in alcohol dull or pale brown, back a deeper shade than lower surface. About 8 longitudinal darker streaks of brownish than general body-color, those below paler. Head brown, lower surface paler. Fins pale brown, dorsal and caudal perhaps a trifle darker. Base of upper caudal lobe with its lower lobe marked with a jet-black blotch a little larger than pupil. Iris pale brownish.

Length about 11 inches (caudal damaged).

Type, No. 16,642, A. N. S. P. Truando, Rio Atrato basin in the Isthmus of Darien, Colombia. From the Smithsonian Institution (No. 1,658).

I am indebted to Mr. Barton A. Bean for the data concerning this fish. According to him it approaches *Xiphostoma hujeta* Valenciennes, a species very imperfectly described though, which it seems to resemble so far as the original account permits. Provisionally at least it had best be considered distinct.

(Named for Mr. Barton A. Bean, Assistant Curator of Fishes, United States National Museum.)

Hydrolycus pectoralis (Günther).

Hydrolycus pectoralis Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 688. Peruvian Amazon. Prof. J. Orton.

Head 4 to $4\frac{3}{4}$; depth $3\frac{1}{4}$ to $3\frac{3}{4}$; D. 11, 10; A. 11, 45, 1 usually, sometimes varying to 43 or 46; scales usually 90 in lateral line to base of caudal; snout $3\frac{1}{2}$ to $4\frac{1}{4}$ in head, measured from tip of upper jaw; eye, measured vertically, $2\frac{7}{8}$ to $3\frac{1}{2}$; interorbital space $3\frac{2}{5}$ to $4\frac{1}{5}$; total length $5\frac{1}{5}$ to $8\frac{1}{4}$ inches. Six examples from collections of 1873 and 1877.

Hydrolycus scomberoides (Cuvier).

Hydrolycus scomberoides Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 292. Between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale River. Robert Perkins.

Head $4\frac{1}{3}$; depth 3; D. 11, 10; A. 11, 40, 1; scales about 112 in lateral

line to base of caudal, though pores much fewer; snout 4 in head, measured from tip of upper jaw; eye 4; maxillary $1\frac{1}{4}$; interorbital space 4; least depth of caudal peduncle 3; length $10\frac{3}{4}$ inches.

Rhaphiodon vulpinus Agassiz.

Rhaphiodon vulpinus Cope, Proc. Amer. Philos. Soc. Phila., XXVII, 1877-78 (May 17, 1878), p. 688. Peruvian Amazon. Prof. J. Orton.

Head $4\frac{1}{8}$ to 5; depth $4\frac{1}{4}$ to $5\frac{1}{8}$; D. II, 10; A. IV, 40 to 42, 1; scales about 120 in lateral line to base of caudal, and about 8 more on latter; snout $3\frac{2}{3}$ to $3\frac{9}{10}$ in head; eye $4\frac{1}{4}$ to $4\frac{1}{2}$; maxillary $1\frac{3}{4}$ to $1\frac{1}{2}$; interorbital space $5\frac{1}{2}$ to 6; least depth of caudal peduncle $3\frac{1}{3}$ to $3\frac{1}{2}$; length of body (caudal damaged) 10 to $12\frac{3}{8}$ inches. Two examples in collections of 1873 and 1877.

Cynodon gibbus (Agassiz).

Raphiodon gibbus Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 688. Peruvian Amazon. Prof. J. Orton.

Head $4\frac{3}{8}$ to $4\frac{4}{5}$; depth $3\frac{1}{4}$ to $3\frac{2}{5}$; D. II, 10; A. IV, 72, 1 to II?, 83?, 1; scales 90 to 100 in lateral line to base of caudal; snout $3\frac{1}{2}$ to 4 in head, measured from tip of upper jaw; eye $3\frac{1}{2}$ to $3\frac{3}{5}$; maxillary $1\frac{7}{8}$ to $1\frac{1}{4}$; interorbital space $3\frac{1}{3}$ to $3\frac{1}{2}$; least depth of caudal peduncle 3 to $3\frac{1}{2}$; length (caudal damaged) 6 to $6\frac{7}{8}$ inches. Two examples in the collection of 1873.

DISTICHODONTINÆ.

Distichodus rudolphi Günther. Fig. 52.

Proc. Zool. Soc. London, 1896 (February 4), p. 223. Cotype, No. 14,559 (type), A. N. S. P. Lake Rudolf, Central Africa. Dr. A. D. Smith.

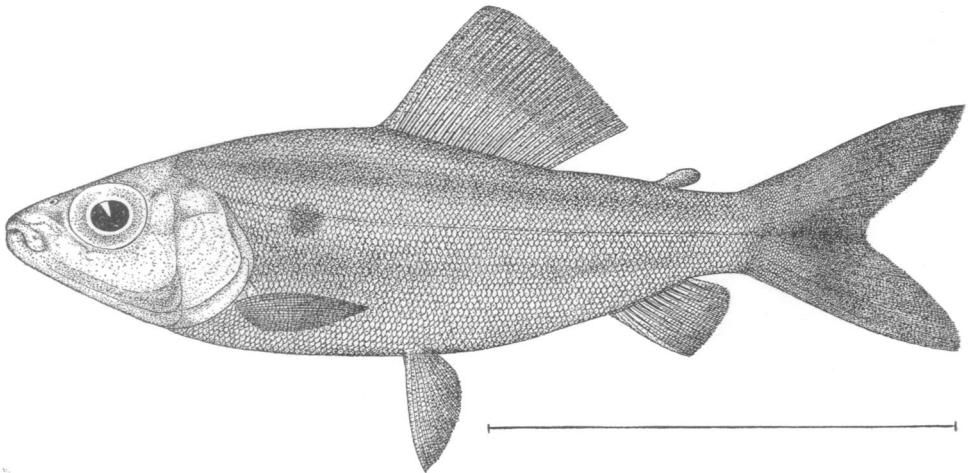


Fig. 52.—*Distichodus rudolphi* Günther.

Width of head $2\frac{1}{4}$ in its length; interorbital space 4. Body compressed with edges all more or less rounded. Head compressed, convexly round or not especially broad above, and sides becoming constricted below. Snout broader than long and surface convex. Teeth in jaws rather weak, though well developed, compressed, uniserial and bidentate. Tongue free and rounded as seen above. Interorbital space rather broad and slightly convex. Gill-opening forward opposite anterior margin of eye. Rakers reduced as minute tubercles, and filaments a trifle less than orbit. Lateral line with simple tubes. Vent close in front of anal. Color in alcohol brownish, sides and lower surface paler, inclining to whitish and all more or less silvered. Lower surface of head also silvered. A pale or dull slaty humeral blotch about size of pupil. A dull or pale dusky diffuse blotch at base of caudal. Fins all pale brownish, dorsal and caudal a trifle darker, and median rays of latter also pale dusky. Iris pale brassy. Length $2\frac{1}{8}$ inches (caudal damaged). Type.

SERRASALMINÆ.

Pygocentrus piraya (Cuvier).

Serrasalmo piraya Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Para. De Schulte Buckow.

Head $2\frac{3}{4}$; depth $1\frac{5}{8}$; D. I, 11, 12; A. III, 29, 1; abdominal serratures 32 to vent; scales about 75 in lateral line to base of caudal and about 8 more on latter; about 33 scales between origin of dorsal and lateral line; about 28 scales between origin of anal and lateral line; about 46 scales before origin of dorsal; about 13 scales obliquely back from origin of adipose fin to lateral line; width of head $2\frac{1}{8}$ in its length; mandible $2\frac{3}{8}$; pectoral $1\frac{1}{8}$; ventral $2\frac{1}{8}$; least depth of caudal peduncle $3\frac{3}{8}$; snout $4\frac{1}{2}$ in head, measured from tip of upper jaw; eye $3\frac{1}{4}$; maxillary $2\frac{1}{4}$; interorbital space 3. In alcohol more or less uniform brownish, margins of caudal broadly a little darker brownish. Iris brassy, brownish above and below. Length $3\frac{1}{4}$ inches.

Pygocentrus nattereri Kner.

Serrasalmo nattereri Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 292. Between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale River. Robert Perkins.

Head $2\frac{1}{2}$ to $2\frac{3}{4}$; depth $1\frac{2}{3}$ to $1\frac{5}{8}$; D. I, 11, 14, 1 to 16, 1; A. I, III, 25, 1 to 28, 1; abdominal serratures 25 to 28; scales 72 to 86 in lateral line to base of caudal and 5 to 10 more continued out on latter; 34 to 38 scales obliquely back from origin of dorsal to lateral line; 30 to 37 scales between origin of anal and lateral line; 15 or 16 scales obliquely back from adipose fin to lateral line; 50 to 54 scales before dorsal; mandible

$2\frac{1}{3}$ to $2\frac{2}{3}$ in head; pectoral $1\frac{1}{4}$ to $1\frac{1}{8}$; ventral 3 to $3\frac{1}{4}$; least depth of caudal peduncle $3\frac{3}{8}$ to $4\frac{3}{8}$; snout 4 to $4\frac{1}{8}$ in head, measured from tip of upper jaw; eye $3\frac{3}{4}$ to $5\frac{1}{2}$; maxillary $2\frac{3}{4}$ to 3; interorbital space $2\frac{1}{4}$ to $3\frac{1}{4}$; total length of body (with slightly damaged caudal) $2\frac{1}{4}$ to $6\frac{1}{2}$ inches. Altogether 5 examples, the largest from between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale river. Of the others 2 belong to Orton's first collection (1873). The remaining 2 examples are small. They are marked with a number of small round brownish spots, each about the size of the pupil, and producing an effect similar to that seen on some examples of *Ephippus argus*. The caudal is margined, within the lobes, and shaded basally with deep brownish. Peruvian Amazon. Prof. J. Orton. Coll. 1877.

Serrasalmus humeralis Valenciennes.

Serrasalmo humeralis Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 292. Between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale River. Robert Perkins.

Head $2\frac{1}{8}$; depth $1\frac{5}{8}$ to $1\frac{9}{16}$; D. I, II, 14, 1 to 15, 1; A. I, III, 29, 1 to 30, 1; scales about 75 to 80 in lateral line to base of caudal, and 6 or 7 more on latter; 32 or 33 scales down from origin of dorsal to lateral line; 34 or 35 scales down from lateral line to origin of anal; abdominal scutes 30 to 32; mandible $2\frac{1}{8}$ to $2\frac{1}{4}$ in head; pectoral $1\frac{1}{2}$ to $1\frac{3}{5}$; ventral $2\frac{2}{5}$ to $2\frac{1}{2}$; least depth of caudal peduncle $3\frac{1}{3}$ to $3\frac{3}{4}$; snout 4 in head, measured from tip of upper jaw; eye 4 to $4\frac{2}{5}$; maxillary $2\frac{2}{5}$ to $2\frac{1}{2}$; interorbital space 3 to $3\frac{3}{8}$; total length of body (caudals damaged) $4\frac{1}{2}$ to $5\frac{1}{4}$ inches. Two examples.

Serrasalmus maculatus (Kner).

Serrasalmo maculatus Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 566. Para. De Schulte Buckow.

Head $2\frac{3}{4}$; depth $1\frac{5}{8}$; D. I, II, 12; A. I, III, 29, 1; scales about 77 in lateral line to base of caudal, and 5 more on latter; about 31 scales between origin of dorsal and lateral line; about 32 between origin of anal and lateral line; abdominal scutes 31; mandible $2\frac{1}{4}$ in head; pectoral $1\frac{3}{8}$; ventral $2\frac{1}{4}$; least depth of caudal peduncle $3\frac{3}{4}$; snout $4\frac{1}{2}$ in head, measured from tip of upper jaw; eye $4\frac{1}{3}$; maxillary $2\frac{4}{5}$; interorbital space $3\frac{2}{5}$; length of body $3\frac{3}{8}$ inches (caudal damaged).

Serrasalmus aesopus (Cope). Fig. 53.

Serrasalmo aesopus Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 269. Type, No. 7,914, A. N. S. P. From the Marañon, between the mouth of the Rio Negro, Brazil, and the Huallaga, Peru. Robert Perkins.

Width of head $2\frac{1}{15}$ in its length; interorbital space $2\frac{3}{8}$ in head, measured from tip of upper jaw. Body strongly compressed. Predorsal region, and postdorsal to adipose fin, with slight median ridge. Chest

convexly rounded. Edges of caudal peduncle above and below convex. Head robust, well compressed. Snout broad with convex surface. Lips fleshy. Teeth large, triangularly cuneate, $\frac{5-5}{7-7}$, and more or less directed backwards. In upper jaw each one with one or more basal cusps, but of mandibulars only symphyseal one with an approximated cusp. Mandibular teeth longer than those above, though of uniform size. Folds of buccal cavity thick and fleshy, more

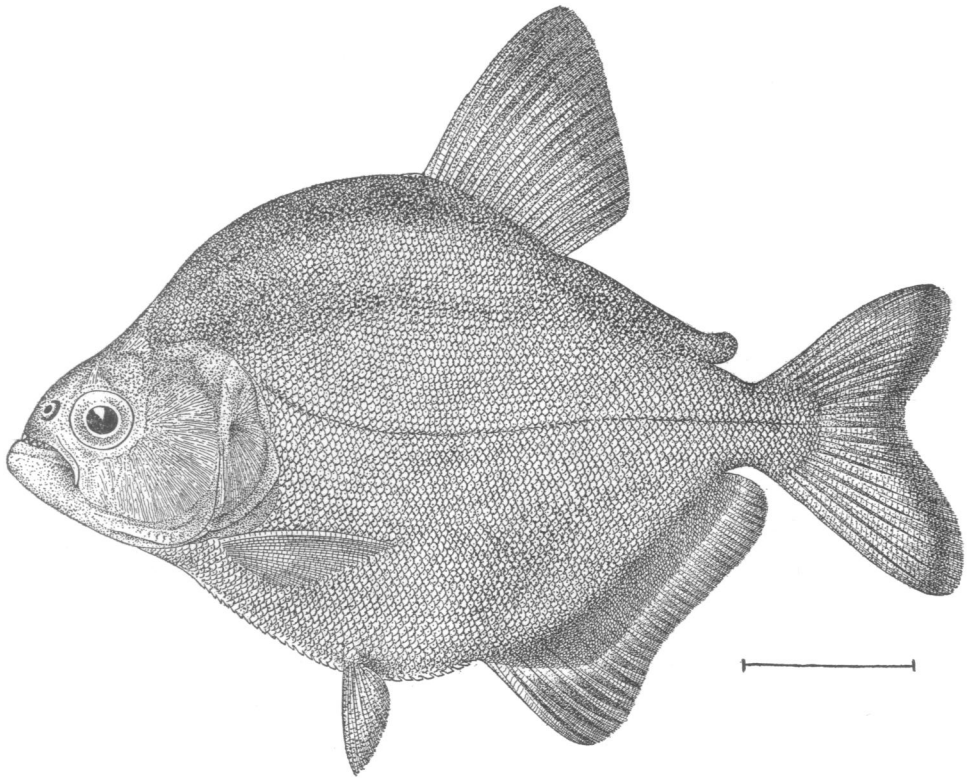


Fig. 53.—*Serrasalmus æsopus* (Cope).

or less papillose and with cutaneous fringe corresponding to teeth. Palatine teeth 5, small and uniserial. Tongue little free, surface papillose. Interorbital space broad and convex. Gill-opening forward to front rim of pupil. Rakers 14 + 12, more or less rudimentary, or about 5 or 6 on ceratobranchial a little enlarged, and all much shorter than filaments which are nearly equal to orbit. Tubes a little bifurcate, or decurved usually. Vent close in front of

anal and not surrounded by abdominal serratures. Color in alcohol faded brownish, back from level with occiput deeper and without brassy tint of lower surface of body. Body also with more or less silvered or brassy reflections. Caudal with a rather broad pale margin, then submarginally rather broadly deep dusky, otherwise pale. Anal with margin rather broadly brownish and base also a little brown. Other fins all more or less pale. Iris yellowish, brownish above. Length $5\frac{7}{8}$ inches.

Serrasalmus iridopsis (Cope).

Serrasalmo iridopsis Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 268. Pl. 9, fig. 2. Type, No. 7,913, A. N. S. P. Ambyiacu River, Ecuador. John Hauxwell.

Width of head $2\frac{1}{3}$ in its length; interorbital space $3\frac{1}{3}$, measured from tip of snout. Body compressed. Head well compressed and robust. Snout convex, and its length $\frac{2}{3}$ its width. Teeth well developed in jaws, those on mandible $\frac{5-5}{6-6}$, large. Each palatine with 7 teeth. Tongue rather narrow, rounded in front and free. Interorbital space broad and convex. Bones of head all more or less radiately striate. Gill-opening forward to middle of eye. Rakers iv + v short denticles, much shorter than filaments, which equal greatest exposed opercular width. Color in alcohol brownish, sides silvered. Back with a number of rounded maculations, ranging in size up to that of pupil, and fading out on flanks. Fins all pale brownish, dorsal and caudal a trifle more deep in shade marginally. Iris pale brassy. Length $4\frac{1}{2}$ inches (caudal damaged).

Although Cope states that the abdominal serratures are "forty-one," his figure would indicate altogether but 31. Still as the type at present shows 32 serræ, it is possible that some of those on the breast may have fallen.

Serrasalmus immaculatus (Cope). Fig. 54.

Serrasalmo immaculatus Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 692. Cotypes, Nos. 21,503 (type) to 21,505, A. N. S. P. Peruvian Amazon. Prof. J. Orton.

Width of head $2\frac{1}{4}$ in its length; interorbital space $2\frac{7}{8}$ in head, measured from tip of upper jaw. Body strongly compressed, and pre-dorsal and postdorsal regions, to adipose fin, with a slight median ridge. Upper and lower surfaces of caudal peduncle a little compressed convexly. Head compressed. Snout broad and surface convex. Teeth $\frac{5-5}{7-7}$. Palatine teeth 7 on each side. Gill-opening forward opposite middle of orbit. Rakers x + viii rounded scabrous processes and each with a short denticulation. Filaments about equal eye. Color in alcohol brownish, more or less dull and uniform or only with

slight silvered reflections, and greenish tints on head and fins evidently due to preservative. Iris a little reddish-brown. Length $7\frac{3}{8}$ inches (caudal damaged).

The others show: Head $2\frac{3}{8}$ to $2\frac{5}{8}$; depth $1\frac{1}{4}$; D. I, II, 13, I to 16, I; A. I, III, 28, I to 31, I; scales about 67 to 78 in lateral line to base of

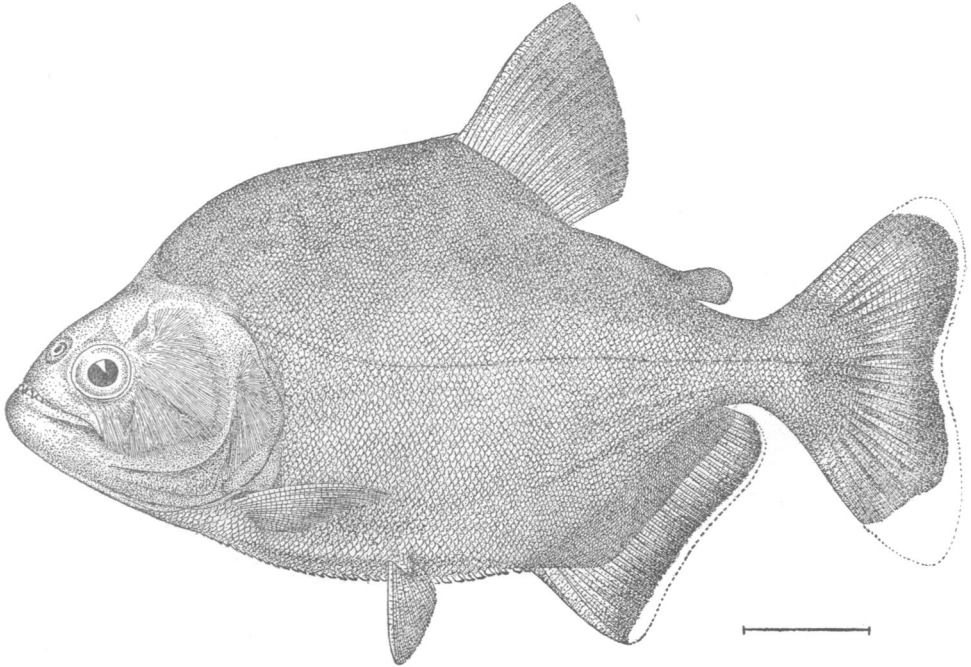


Fig. 54.—*Serrasalmus immaculatus* (Cope).

caudal, and 6 to 8 more on latter; mandible $1\frac{2}{5}$ to $2\frac{3}{8}$ in head; pectoral $1\frac{3}{8}$ to $1\frac{3}{4}$; ventral $2\frac{3}{4}$ to $3\frac{1}{5}$; least depth of caudal peduncle $3\frac{1}{2}$ to $3\frac{3}{4}$; base of dorsal $1\frac{3}{8}$ to $1\frac{4}{5}$; snout $4\frac{1}{5}$ to $4\frac{1}{2}$ in head, measured from tip of upper jaw; eye $4\frac{1}{8}$ to 5; maxillary $2\frac{3}{8}$ to $2\frac{7}{8}$; interorbital space 3 to $3\frac{1}{8}$; greatest width of infraorbital rim $2\frac{4}{5}$ to 3; length of body (caudal damaged) $6\frac{1}{4}$ to $6\frac{7}{8}$ inches. Though the dusky posterior caudal margin is evident, the numerous lead-colored spots on the back are not.

Subgenus COLOSSOMA Eigenmann.

Anterior and posterior series of teeth in upper jaw close together.

Colossoma oculus (Cope).

Myletes oculus Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 262, Pl. 12, fig. 2. Cotypes, Nos. 7,991 (type) to 8,010, A. N. S. P. Ambyiacu River. John Hauxwell.

Width of head 2 in its length; interorbital space $2\frac{1}{2}$ in head, measured

from tip of upper jaw. Body strongly compressed, and edges mostly rounded. Head robust, compressed, and becoming constricted below. Lips thin, cutaneous, and on each side of mandible forming anteriorly a long flattened triangular flap equal to about $\frac{1}{4}$ of orbit. In each side of upper jaw externally 5 teeth, and each with a single cusp at least. Transversely in front of upper jaw 4 bicuspid teeth connecting lateral series. Mandible with 4 enlarged teeth transversely in front, pair approximated at symphysis with a large posterior cusp to each one, and 4 small teeth on each ramus graduated down posteriorly. Tongue a little long. Interorbital space broad and convex. Opercle with fine concentric striæ. Gill-opening forward to front rim of orbit. Rakers 20 + 24, slender, and longest equals pupil. Longest filaments $\frac{3}{4}$ of orbit. Tubes of lateral line simple. Vent enclosed in serræ close in front of anal. Color in alcohol pale brownish and sides more or less silvered. Fins all pale brownish, anal and median caudal rays a trifle deeper. Sides of body with vertical brownish streaks, and one about midway on side close behind lateral line forming an ocellus. Iris slaty-white. Length $2\frac{1}{4}$ inches (caudal damaged). Type.

The others show: Head $2\frac{1}{4}$ to $2\frac{3}{5}$; depth $1\frac{1}{4}$ to $1\frac{1}{8}$; D. III, 12, 1 to 15, 1, usually 14, 1, sometimes 13, 1, occasionally 12, 1, and rarely 15, 1; A. III or IV, 20, 1 to 23, 1, usually 21, 1 or 22, 1 and only rarely 20, 1 or 23, 1; abdominal serratures 44 to 53; about 60 to 72 scales in lateral line to base of caudal; snout $3\frac{3}{8}$ to 4 in head, measured from tip of upper jaw; eye 3 to $3\frac{1}{2}$; interorbital space $2\frac{1}{8}$ to $2\frac{1}{2}$; pectoral $1\frac{3}{8}$ to $2\frac{1}{4}$; ventral $1\frac{7}{8}$ to $2\frac{1}{3}$; total length of body $1\frac{8}{16}$ to $2\frac{5}{8}$ inches.

WAITEINA subgen. nov.

Type *Myletes nigripinnis* Cope.

Anterior and posterior series of teeth well separated anteriorly in upper jaw.

(Named for Dr. Edgar R. Waite, formerly of the Museum at Sydney, author of many contributions to the Ichthyology of Australia.)

Colossoma nigripinnis (Cope). Fig. 55.

Myletes nigripinnis Cope, Proc. Amer. Philos. Soc. Phila., 1877-78 (May 17, 1878), p. 693. Type, No. 21,124, A. N. S. P. Peruvian Amazon. Nauta. Prof. J. Orton.

Width of head 2 in its length; interorbital space $2\frac{1}{8}$ in head, measured from tip of upper jaw. Body well compressed. Predorsal region trenchant and edges of body otherwise mostly rounded. Head well compressed, becoming constricted below. Snout broad and convex

on surface. Teeth large in mandible, those anteriorly forming transverse series of 4 largest and other 5 on each side of mandible graduated down posteriorly. Anterior mandibular teeth with cutting edges, and each one at symphysis with a large cusp. In upper jaw 5 teeth in each external series approximated with 4 transverse annectant ones, which latter together with last 3 externals, are bicuspid. Tongue thick and not free. Lips a little fleshy. Interorbital space broadly

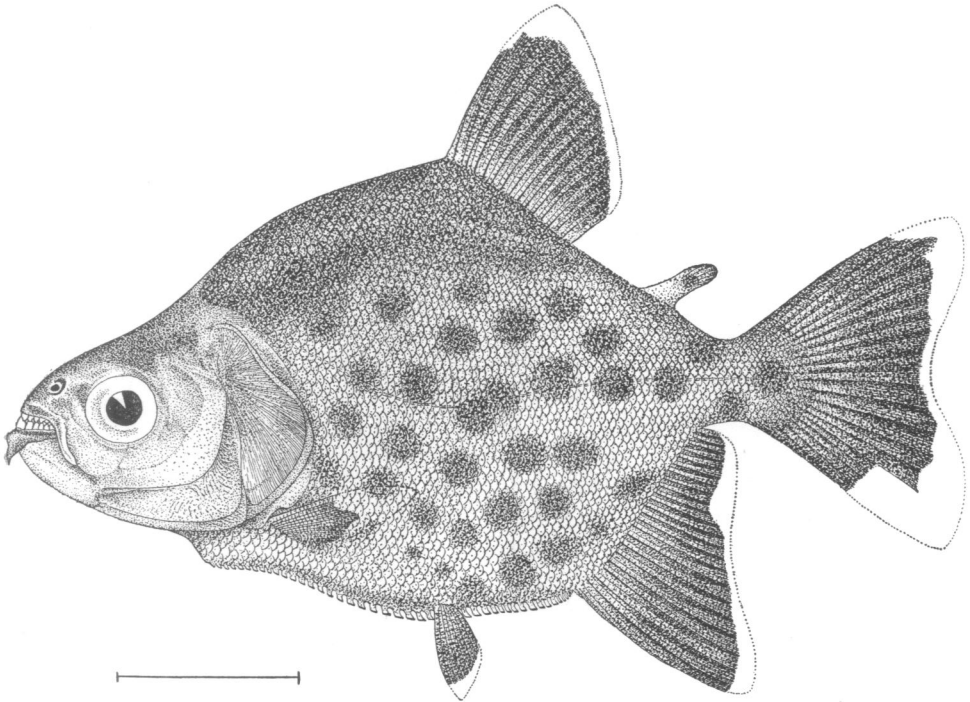


Fig. 55.—*Colossoma nigripinnis* (Cope).

convex. Gill-opening forward to front edge of eye. Rakers $39 + 39$, slender, about $\frac{5}{7}$ of orbit. Filaments equal orbit. Tubes in lateral line simple. Color in alcohol olivaceous-brown, greenish most likely due to preservative, and lower regions but little paler. Trunk with many blackish or dusky blotches as large as or a little larger than pupil, those below smallest. Membrane of fins more or less dusky-brown, dorsal paler, and also bases of caudal, pectoral and ventral pale. Lips dusky or brownish. Iris yellowish. Length $5\frac{1}{8}$ inches (caudal damaged).

Cope's statement, that "the two posterior mandibulars are in contact with the median pair of the anterior series, and are separated by a narrow interspace from each other," evidently refers to the teeth of the upper jaw.

REGANINA gen. nov.

Type *Myletes bidens* Agassiz.

Body rather elongate, not entirely orbicular, or not as deep as long. Abdominal profile moderately convex, not pendant. Abdominal serratures rather numerous, 56. Squamous area on base of anal fin rather low and sharply defined from rest of fin. Adipose fin rather free, not especially enlarged or elongated. No external free short cultrate predorsal spine.

(Named for Dr. C. Tate Regan, of the British Museum of Natural History, author of many excellent contributions to Ichthyology.)

Reganina bidens (Agassiz).

Myletes bidens Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 291. Between the mouth of the Rio Negro and the Peruvian Amazon or Ucayale River. Robert Perkins.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 694. Peruvian Amazon. Prof. J. Orton.

Head 3; depth $1\frac{3}{8}$; D. v, 14; A. III, 23, 1; abdominal serratures 51 + 5; scales about 85 in lateral line to base of caudal, and 5 more on latter; 35 scales between origin of dorsal and lateral line; about 40 scales between vent and lateral line, and same number between root of ventral and lateral line; 46 scales before dorsal; snout $3\frac{3}{4}$ in head, measured from tip of upper jaw; eye $4\frac{1}{4}$; mandible $2\frac{7}{8}$; interorbital space $2\frac{1}{8}$; pectoral $1\frac{3}{8}$; ventral $1\frac{1}{4}$; least depth of caudal peduncle $2\frac{5}{8}$. Gill-rakers 19 + 18, 1, lanceolate, and about $\frac{1}{3}$ of longest filaments, which are about equal to orbit. Color in alcohol brownish, belly paler, and fins all more or less brownish, becoming darker marginally. Anal with a longitudinal median brown band, anterior radii of fin pale or whitish. Opercle with a brownish blotch. Iris dull yellowish. Length 9 inches. Between the mouth of the Rio Negro and the Peruvian Amazon. Robert Perkins.

This example agrees largely with Agassiz' figure. However, the scales on the base of the anal fin are not indicated as sharply demarcated from the rest of the same, so that in width this squamous area is but a little broader anteriorly.

Mylossoma albiscopius (Cope).

Myletes albiscopius Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 267, Pl. 12, fig. 1. Cotypes, Nos. 8,014 to 8,021 (type), A. N. S. P. Ambyiacu River. John Hauxwell.—Cope, *l.c.*, p. 292. Between the mouth of the Rio Negro and the Peruvian Amazon. Robert Perkins.

Width of head 2 in its length; interorbital space $2\frac{1}{8}$ in head, measured

from tip of upper jaw. Body strongly compressed, edges rounded. Head robust. Snout broad and convex. Lips without triangular cutaneous corners, though broad. Upper teeth 5 in each external series, and with a transverse connecting series of 4. Mandibular teeth larger, 8 in number, 4 median greatly enlarged and pair at symphysis each with a large external cusp. All teeth with a cutting edge, and some, like transverse series above, bicuspid. Tongue not free, broad and rounded in front. Interorbital space broad and convex. Gill-opening forward opposite front of eye. Rakers 12 + 18, lanceolate and equal pupil. Filaments a trifle less than orbit. Tubes in lateral line simple. Color in alcohol dull or pale brassy-brown, back a little darker than lower surface and everywhere with more or less brassy reflections. Fins all pale or uniform brownish. Iris dull or pale orange. Length 6 inches. Type.

The others show: Head $2\frac{3}{4}$ to $3\frac{1}{2}$; depth $1\frac{1}{2}$ to $1\frac{1}{2}$; D. III, 13, 1 to 16, 1, usually 14, 1 or 15, 1; A. III or IV, 31, 1 to 36, 1; scales 70 to 78 in lateral line to base of caudal, and 3 to 9 more on latter; serratures 41 to 47 + 4 to 8 on abdomen; snout $3\frac{1}{2}$ to 4 in head; eye $2\frac{3}{4}$ to 4; interorbital space $2\frac{1}{2}$ to $2\frac{3}{4}$; pectoral $1\frac{1}{2}$ to $1\frac{3}{4}$; ventral 2 to $2\frac{1}{4}$; total length of body $2\frac{1}{16}$ to $5\frac{1}{2}$ inches, with caudals mostly damaged. The opercular blotch at present is only a little brownish in most cases.

STARKSINA gen. nov.

Type *Myletes herniarius* Cope.

Body nearly as deep as long. Profile of belly well rounded convexly and pendant. Abdominal serratures rather few, 41. Posterior series of teeth in upper jaw separated from anterior by an interspace. Anal and caudal more or less covered with small scales passing out from body without special demarcation. Adipose fin small and free. No external free short cultrate predorsal spine.

(Dedicated to Mr. Edwin C. Starks, of the Leland Stanford Junior University, California, well known for his contributions to the osteology of fishes.)

Starksina herniarius (Cope). Fig. 56.

Myletes herniarius Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 268, Pl. 12, fig. 3. Cotypes, Nos. 7,990 and 8,025 (type), A. N. S. P. Ambyiacu River. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 693. Peruvian Amazon. Prof. J. Orton.

Width of head $1\frac{1}{2}$ in its length; interorbital space $2\frac{1}{4}$ in head, measured from tip of upper jaw. Edges of body more or less trenchant. Head well compressed, becoming a little restricted below. Snout

broad and convex. Lips thin. Teeth in jaws heavy, robust, and all more or less smaller and of subequal size in upper jaw. In latter arranged in an external approximated series of 5 on each side, and each with a cusp at least, those most external with 3. Transversely 4 teeth connecting outer series, and tip of each with as many as 4

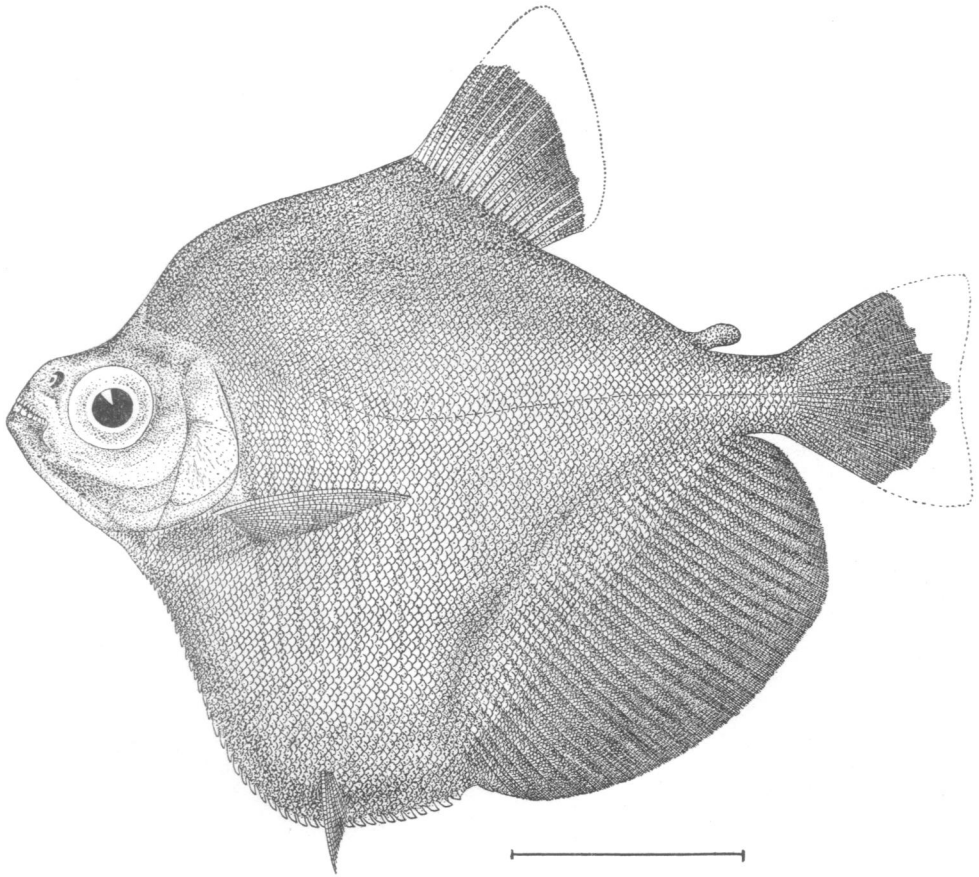


Fig. 56.—*Starksina herniarius* (Cope).

cusps in most cases. Mandibular teeth arranged transversely across front of mandible, 3 on each side, with cutting edges, each with 1 cusp at least and each symphyseal with a large conic internal cusp. External mandibular teeth small and inconspicuous, and posterior dentary edges hard and rather sharp. Tongue a little elongate and not free. Interorbital space broad and convex. Gill-opening for-

ward nearly opposite front rim of eye. Rakers $12 + 12$, lanceolate, and longest 3 in eye. Filaments $1\frac{1}{2}$ in eye. Tubes in lateral line simple. Vent close in front of anal, without serræ. Color in alcohol plain dull brassy-brown, and back more or less dull plumbeous-brown. Fins uniformly colored pale brown. Iris deep brown. Length $4\frac{1}{2}$ inches (caudal damaged). Cotype.

SEALEINA gen. nov.

Type *Myletes lippincottianus* Cope.

Body nearly orbicular. Abdominal profile moderately and evenly convex, not pendant. Abdominal serratures rather few, 42. Pos-

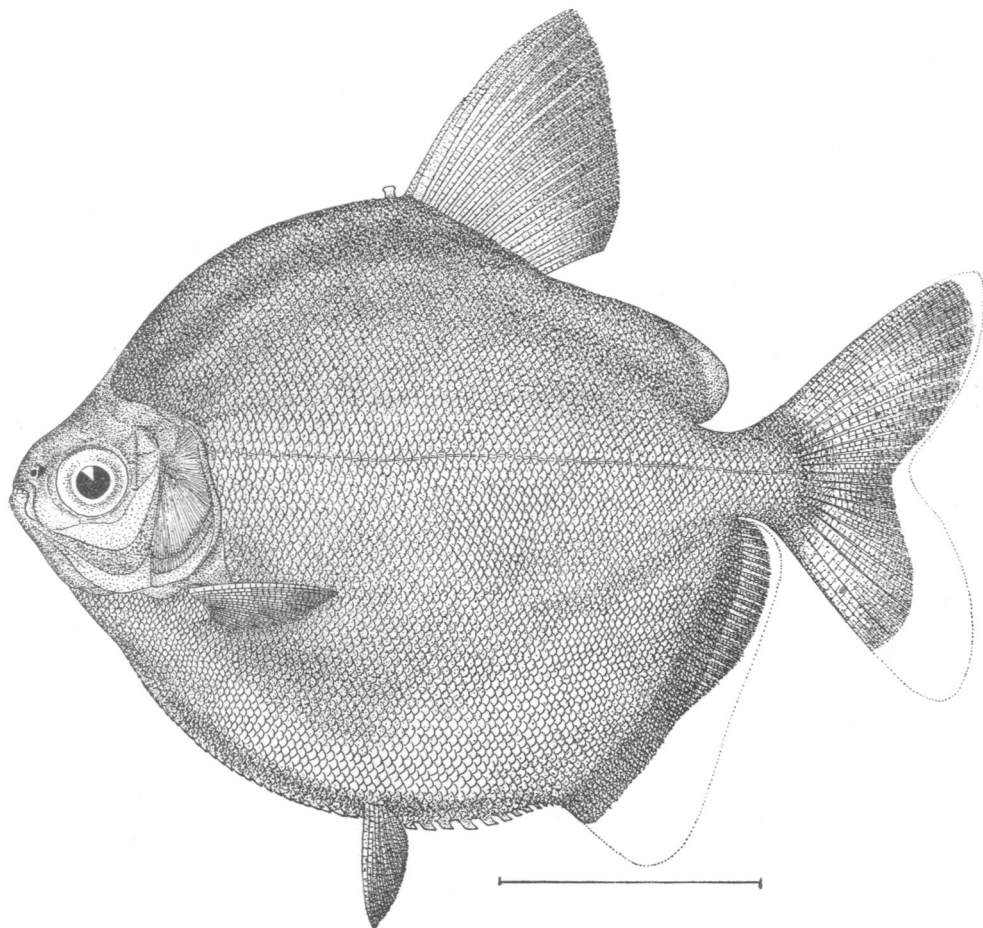


Fig. 57.—*Sealeina lippincottianus* (Cope).

terior series of teeth in upper jaw not separated from anterior by an interspace. Squamous area on base of anal rather low and well defined from marginal part of fin. Adipose fin large, long, not free. A small external short free cultrate predorsal spine.

(Named for Mr. Alvin Seale, formerly of the Bishop Museum at Honolulu, Hawaiian Islands, the first to offer a complete account of the Ichthyology of Guam.)

***Sealeina lippincottianus* (Cope). Fig. 57.**

Myletes lippincottianus Cope, Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 561, fig. (teeth). Cotype, No. 8,024, A. N. S. P. Para, Brazil. De Schulte Buckow.—Cope, *l.c.*, p. 566 (type).

Width of head $1\frac{1}{2}$ in its length; interorbital space $2\frac{1}{2}$ in head, measured from tip of upper jaw. Edges of body all more or less rounded. Head compressed, becoming a little constricted below. Snout broad and convex. Mouth broadly transverse. Tongue elongate, little free. Interorbital space broadly convex. Gill-opening forward to posterior nostril. Rakers about $10 + 15$, lanceolate, about $\frac{3}{4}$ of pupil. Filaments about $\frac{1}{2}$ of eye. Tubes in lateral line simple. Color in alcohol pale brassy-brownish, back darker or more brownish from level with upper edge of gill-opening. Fins all more or less plain pale brownish, and without markings. Iris brassy. Length $3\frac{3}{4}$ inches (caudal lobes a little damaged). Cotype.

I restrict the specimen described above as one of Cope's cotypes, as it is possible his description is based on more than one example. The statements that there are 32 abdominal serratures and that the adipose fin is $\frac{2}{3}$ the length of the rayed dorsal do not agree with my example.

***Metynnis luna* Cope. Fig. 58.**

Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 692. Type, No. 21,443, A. N. S. P. Peruvian Amazon. Prof. J. Orton.

Width of head $2\frac{1}{2}$ in its length; interorbital space $2\frac{1}{2}$. Body greatly compressed. Snout broad and with surface convex. Lips thin. Teeth rather small, above with both series close together, 5 on each side externally and 4 annectant transversely. In mandible 4 on each side, median 4 largest, and in turn middle pair each with a large posterior cusp. Each tooth with at least a median point, those of mandible also with cutting edge, and inner series of upper jaw with 2 cusps to each tooth. Tongue not free, thick. Interorbital space broad and convex. Gill-opening forward to front margin of pupil. Rakers $26 + 26?$, slender, about $\frac{1}{2}$ of eye, and filaments about $\frac{3}{4}$ of latter. Some of tubes in lateral line simple. Color in alcohol brownish, back somewhat dark and plumbeous, and all of lower regions brassy and

silvered. Fins uniform dull brownish. Iris reddish-brown. Length $2\frac{3}{8}$ inches (caudal damaged). Type.

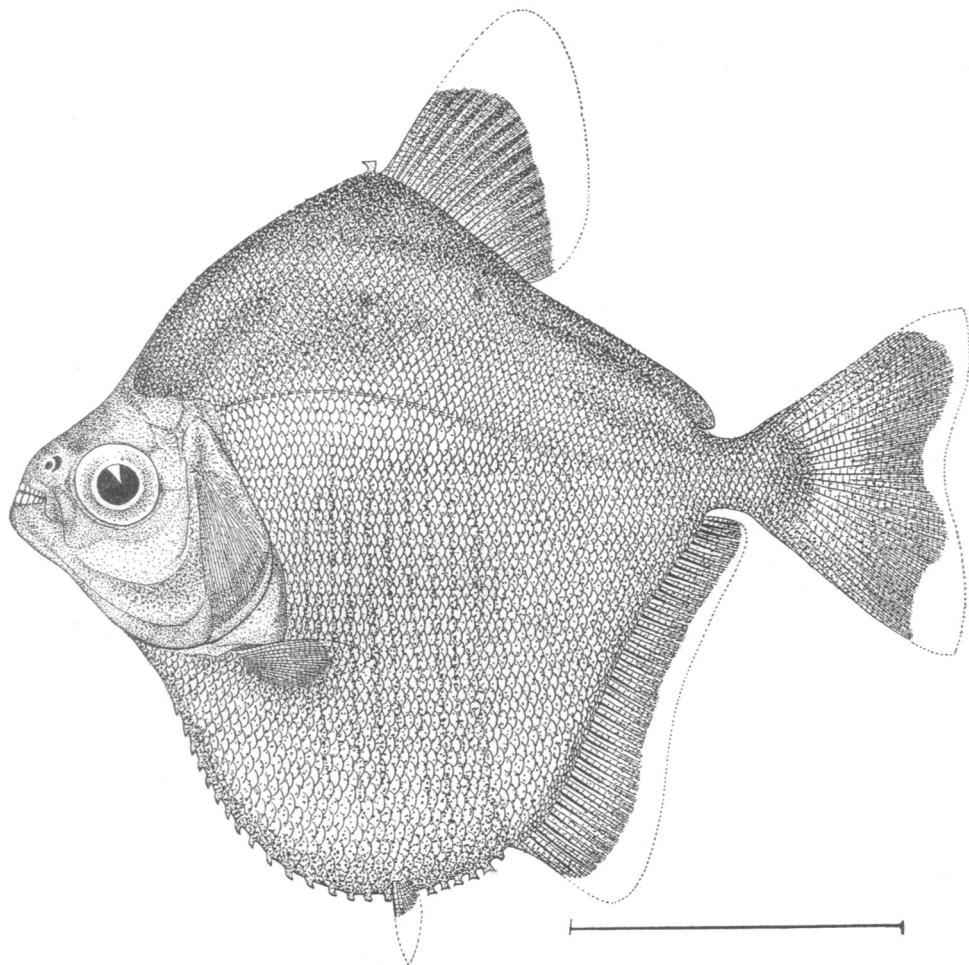


Fig. 58.—*Metynnis luna* Cope

Cope's statement that "the head enters the latter [*i.e.*, length of body without caudal] three and two-tenth times" is incorrect, as I find it about $2\frac{3}{4}$.

Stethaprion erythrops Cope. Fig. 59.

Proc. Amer. Philos. Soc. Phila., XI, 1869-70 (August 19, 1870), p. 562, fig. (2). Type, No. 8,031, A. N. S. P. Pebas. John Hauxwell.

Width of head $1\frac{1}{8}$ in its length; interorbital space $2\frac{3}{8}$ in head, meas-

ured from tip of upper jaw. Body greatly compressed and edges, except rounded upper and lower surfaces of caudal peduncle, with a slight median ridge. Head a little robust, compressed, and becoming a little constricted below. Snout broadly convex. No palatine teeth, others as in *Astyanax*. Tongue a little long, not free. Inter-

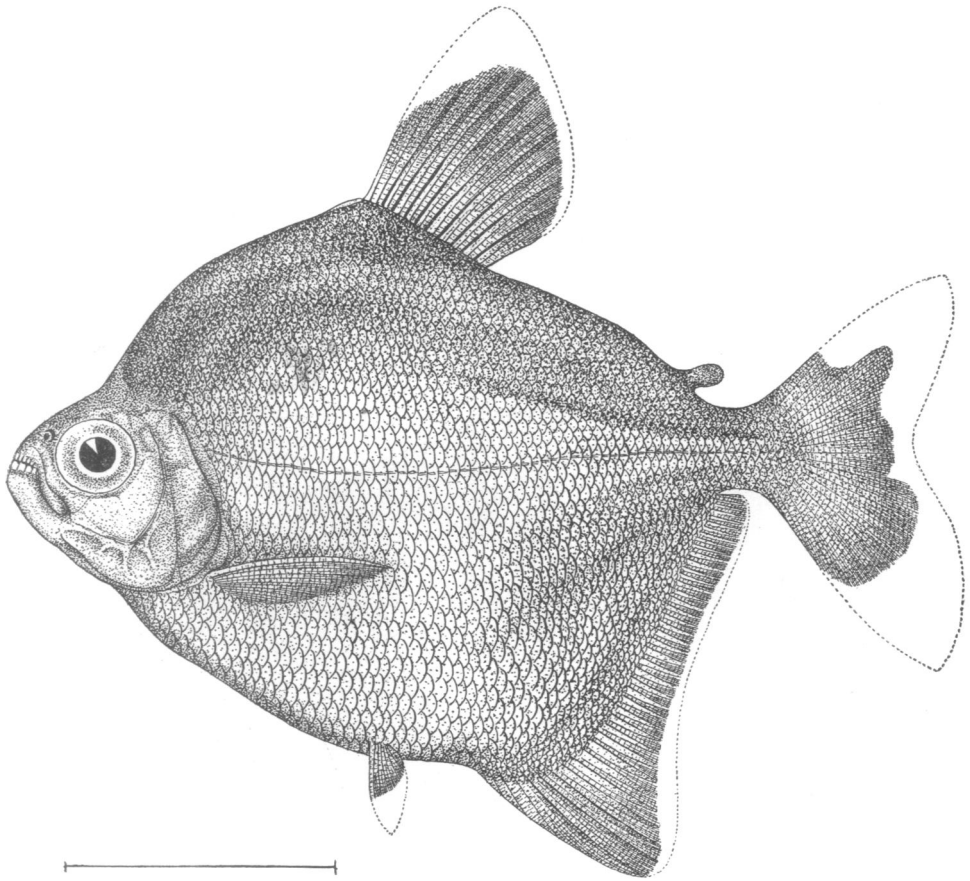


Fig. 59.—*Stethaprion erythrops* Cope.

orbital space broad and convex. Gill-opening forward nearly opposite front of eye. Rakers 13 + 14, lanceolate, and a little less than pupil. Filaments 2 in eye. Tubes in lateral line simple. Vent close in front of anal. Color in alcohol pale brownish, back a little darker, and body more or less with brassy-silvery reflections. A dull leaden and pale streak along posterior or straight portion of lateral line. Fins all dull

brownish. Side of head silvered. Iris deep reddish-dusky. Length $3\frac{9}{16}$ inches (caudal damaged).

Owing to Cope's imperfect figure I have substituted the accompanying one, made from the type.

Stethaprion chryseum Cope. Fig. 60.

Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 261. Type, No. 8,030, A. N. S. P. Ambyiacu River. John Hauxwell.—Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1877-78 (May 17, 1878), p. 692. Peruvian Amazon. Prof. J. Orton.

Width of head 2 in its length; interorbital space $2\frac{1}{4}$ in head, measured from tip of upper jaw. Gill-rakers 9 + 13. Color in alcohol more

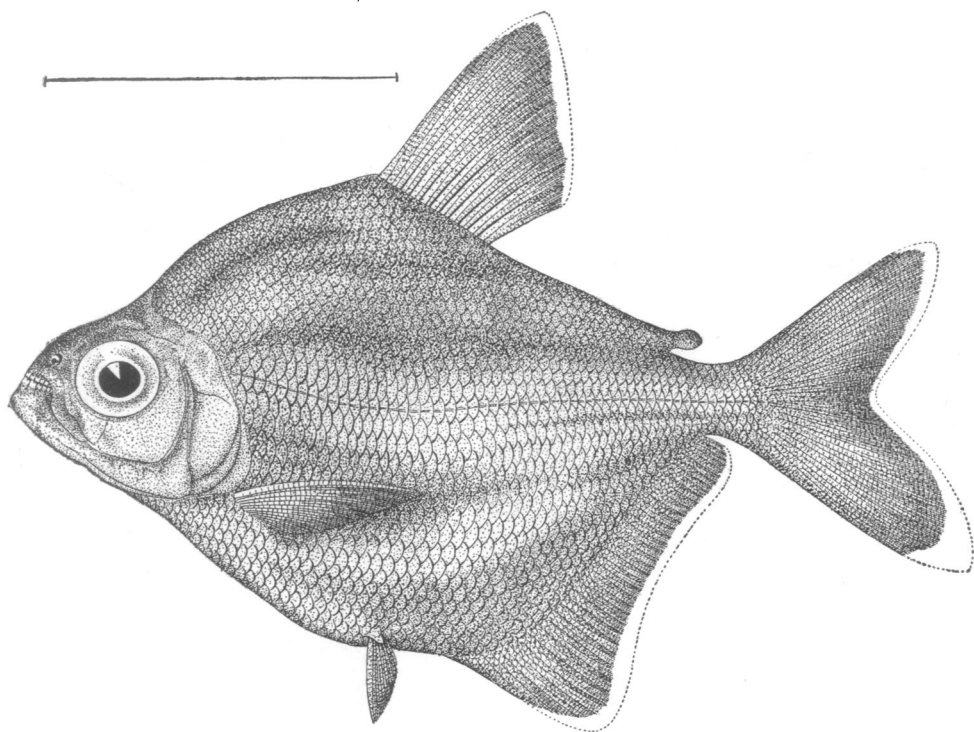


Fig. 60.—*Stethaprion chryseum* Cope.

or less uniform brown. In most respects similar to the preceding Length $2\frac{1}{4}$ inches (caudal damaged). Type.

In Part I of this paper a number of figures have been blurred by the printer, and as this may cause confusion in their comparison I give a list with explanations.

In the following figures the portions indicated are blurred:

- P. 298, fig. 4, *Curimata spilura*. Snout, interorbital space and side of mandible.
- P. 314, fig. 14, *Prochilodus theraponura*. Snout.
- P. 316, fig. 15, *P. amazonensis*. Snout, tip of first branched dorsal ray and lower pectoral rays.
- P. 332, fig. 21, *Cheirodon pulcher*. Upper surface of snout, end of rayed dorsal and median caudal rays.
- P. 336, fig. 24, *Hemigrammus robustulus*. Tip of upper caudal lobe.
- P. 337, fig. 25. *Astyanax ipanquianus*. Teeth, iris in front, breast, greater basal portion of pectoral fin together with scales just above, and anterior rays of anal basally.
- P. 340, fig. 28, *Astyanax huxwellianus*. Tips of jaws and ends of anterior long dorsal rays.